APPENDIX C: **Public Comments on the EA**

C.1 Response to Public Comment Letters/Email Messages

In response to a September 16, 2003 lawsuit filed in Federal District Court challenging the adequacy of the 2002 EA, the Court ruled that the EA was adequate. In response to an October 2006 appeal by the Plaintiffs, the Ninth Circuit concluded that while DOE did take a hard look at identified environmental concerns and that its decision was fully informed and well-considered, the DOE did not consider whether the threat of potential terrorist activity necessitates the preparation of an environmental impact statement and thus remanded the matter to the DOE. In response to this ruling and new DOE guidance, DOE has revised the 2002 EA to consider the potential impacts of terrorist activity. The revised Draft Environmental Assessment (EA) was made available for public comment from May 11, 2007 to June 11, 2007. Over 80 comment responses were received from residents of 8 different states and the District of Columbia.

For this document, the public comment appendix from the 2002 EA has been supplemented to include a summary of additional public comments that provided new information pertinent to the proposed action or expressed concerns that were not previously responded to in the original document. Letters and emails providing comments on the Revised EA are included in Section C.2.

1. NEPA COMPLIANCE: DOCUMENTATION/REVIEW LEVEL.

Several commenters expressed the opinion that a BSL-3 facility at LLNL would allow for experiments with a broad spectrum of biotoxins and biological materials/agents. They believed that this would be a new program for DOE and LLNL that, if inadequately analyzed before proceeding, could endanger the workers and the community. Commenters indicated that the draft EA provided only boilerplate assertions that the risks would be negligible, and relies on adherence to procedures, some of which DOE laboratories have not followed in the past according to the commenters. Consequently, they believe that a further environmental review in the form of a project-specific Environmental Impact Statement (EIS) should be conducted. Some of the same commenters were of the opinion that the proposed project represents an integrated new program area for the DOE, and as such, a Programmatic EIS (PEIS) should be prepared to review the effects of undertaking work in this "new" mission area. Several commenters expressed the opinion that the purpose and need for the proposed action at LLNL is without precedent, and the commenters called for a complete NEPA review (PEIS) of the NNSA Chemical and Biological National Security Program (CBNP) which some referred to as the "Chemical and Biological Nonproliferation Program."

One commenter expressed the opinion that "… analysis of terrorist risk at a BSL-3 facility is far too significant to be performed using an interim guidance, which does not include the full requirements and which may be changed in the final guidance. DOE/NNSA must withdraw this revised EA and release a second revision of the EA for public review following the finalized guidance."

Several commenters noted that NNSA withdrew the EA for the BSL-3 facility at the Los Alamos National Laboratory (LANL) and is currently preparing an Environmental Impact Statement. Commenters suggested that since NNSA is preparing an EIS for the LANL BSL-3, NNSA should prepare an EIS for the LLNL BSL-3.

Response

LLNL has been a national focus of bioscience research for almost four decades. Bioscience researchers at LLNL already safely conduct research at BSL-1 and BSL-2 levels in disease susceptibility, prevention, diagnosis, treatment, and rehabilitation and in support of National Institutes of Health (NIH), DOE, and NNSA mission requirements, LLNL already works on research aimed at detection and identification of biological warfare agents. The Biology and Biotechnology Research Program (BBRP) at LLNL also contributes to a number of high-profile national-level efforts in both health-related bioscience research and in developing defenses against the potential use of biological-warfare agents against either our civilian population or military forces. This work involves close cooperation with other national laboratories, DOE, and other agencies (e.g., health, military, and law enforcement). Currently, research conducted at the existing LLNL BSL-2 laboratories involves anthrax (Bacillus anthracis) and plague (Yersinia pestis). This research includes supporting development of tests for quick identification of plague based on a DNA signature and the development of decontamination reagents. Operation of a BSL-3 facility would not constitute a new or unique role for LLNL, would not be inconsistent with existing DOE mission work, and would not be unique or without precedent.

The EA analysis considered effects relating to human health, ecological resources, air quality, noise, waste management, soils, geology, and seismology. Effects to these resource areas were minor in nature. Human health effects are expected to be no different from those at other U.S. Centers for Disease Control and Prevention (CDC)-registered laboratories operated according to CDC and NIH guidelines. Those laboratories experience very infrequent worker accidents with minor or no consequences to workers and members of the public. Socioeconomics, visual resources, transportation, utilities and infrastructure, cultural resources, environmental justice, and environmental restoration resources were identified as being unaffected by the construction and operation of the BSL-3 facility; or as being minimally affected and inherently mitigated by the project design; or as being minimally affected and temporary and intermittent in nature. Because the potential effects of the project are not significant in terms of context and intensity, the NNSA has concluded that the potential project effects do not require preparation of a project-specific EIS.

When considering the issue of preparing a programmatic NEPA analysis, a Federal agency must determine whether the program in question meets the Council on Environmental Quality (CEQ's) NEPA Implementing Regulations (40 CFR 1508.18(b)(3)) definition of a major federal action, which includes the: "Adoption of programs, such as a group of concerted actions to implement a specific policy or plan; systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive." These regulations also address when an agency must prepare a programmatic analysis, including the analysis of cumulative effects. A programmatic analysis is necessary where the proposals for federal action "are related to each other closely enough to be, in effect, a single course of

action." Additionally, the CEQ regulations speak to the scope of NEPA EISs (40 CFR 1508.25(a)(1)) and to connected actions such as those that "automatically trigger other actions which may require EISs"; "cannot or will not proceed unless other actions are taken previously or simultaneously"; or "are interdependent parts of a larger action and depend on the larger action for their jurisdiction". DOE and NNSA conduct biological research at various facilities across the DOE complex of national security laboratories and other research institutions. This research began in the late 1940s when the DOE's predecessor agency recognized the need for obtaining information about the effects of radiation on humans and other biota. As an outgrowth of this research, many individual studies and research projects have been conducted over the years both for the benefit of DOE (and its predecessor agencies) and as "work-for-others" projects with sponsors from the private sector and other Federal agencies. Each of DOE's facilities has developed specialized areas of focus and expertise and on some occasions have contributed their expertise to performing portions of work that has been pulled together to answer complex questions or reach complex goals, such as work performed recently to map the human genome. At this time, the NNSA believes that these research efforts consist of projects too diverse and discrete to constitute either a "major Federal action" or activities sufficiently "systematic and connected" so as to require a programmatic NEPA analysis, especially an EIS. Not only are the research projects diverse, they are discrete and independent in nature. They are separately operated and approval of one project does not insure the approval of other similar projects. Success in one project area does not invariably affect the variety or direction of NNSA's research, in as much as NNSA's research program is largely reactive, designed to respond to the needs of NNSA, DOE, and other user groups and consumers. While DOE responded to the 1996 Congressional passage of the Defense Against Weapons of Mass Destruction Act, which authorized the DOE to establish a Chemical and Biological Weapons Nonproliferation Program (now known as the Chemical and Biological National Security Program), its research has continued to build upon existing research expertise present at its various research institutes. DOE and NNSA have not expanded their research such that their projects are concerted or systematic and connected. Mere commonality of objectives is insufficient under the CEQ's NEPA Implementing Regulations to constitute a "major Federal action" requiring NEPA compliance in the form of a programmatic NEPA analysis. While NNSA's biological research projects all pertain to biota and are ultimately directed toward the support of NNSA's national security mission, these rudimentary similarities are not sufficient to bind the universe of research projects conducted by DOE and NNSA into a "program" as this is identified by the CEQ's NEPA Implementing Regulations (40 CFR 1508.18(b)(3)). NNSA is therefore of the opinion that no programmatic NEPA analysis is necessary at this time for biological research conducted at its facilities and this EA is sufficient to meet NNSA's NEPA compliance requirements with regard to the construction and operation of the proposed BSL-3 facility at LLNL.

On December 1, 2006, the DOE Office of NEPA Policy and Compliance issued a memorandum on the subject "Need to Consider Intentional Destructive Acts in NEPA Documents". This document provided guidance on the need to analyze intentional destructive acts in NEPA documents. The document states "While … further guidance is in preparation, DOE NEPA practitioners should immediately implement the guidance in this notice to explicitly consider the potential impacts of intentional destructive acts in NEPA documents…". It is therefore

appropriate and consistent with the intent of the memorandum to develop this EA using the guidance provided by that document.

The "Notice of Intent To Prepare an Environmental Impact Statement for the Operation of a Biosafety Level 3 Facility at Los Alamos National Laboratory" from the Federal Register (Vol. 70, No. 228, November 29, 2005) explains NNSAs basis for determining that an EIS should be prepared for the LANL facility. In 2002, prior to constructing the facility, NNSA analyzed the project pursuant to NEPA and determined that an EA appropriate level of review. An EA was prepared and a Finding of No Significant Impact (FONSI) for the construction and operation of the facility was issued. After completion of the NEPA process and facility construction, NNSA identified new information concerning the BSL–3 Facility. NNSA determined that it was necessary to conduct additional seismic analysis of the location of the building on fill material on the sloping side of a canyon. Therefore, in early 2004, NNSA withdrew the portion of the FONSI that dealt with the operation of the BSL–3 Facility, and announced that it would prepare a supplemental EA on its proposal to operate the facility. In January 2005, NNSA published a Notice of Intent to prepare a Supplemental Site-wide Environmental Impact Statement (S–SWEIS) for the continued operation of LANL. The notice stated that if a FONSI for operation of the BSL–3 Facility could not be issued, the analyses of the potential impacts of operating this facility would be included in the S– SWEIS. NNSA then decided to prepare a new Site-wide EIS for LANL (SWEIS) rather than to supplement the 1999 SWEIS instead of a S-SWEIS. The Federal government, and in particular the intelligence community, was concerned that any delays in the schedule for the SWEIS could further delay a decision on whether to operate this critical homeland security facility. Because of these events, NNSA decided that preparation of an EIS was appropriate for operation of the LANL BSL–3 Facility and that this analysis should be conducted separately from the new SWEIS. This decision is not pertinent to the NNSA determination that an EA is the appropriate level of NEPA documentation for the LLNL BSL-3 Facility.

2. SAFETY OF LABORATORY OPERATIONS

Several commenters expressed the general opinion that LLNL has a history of leaks, spills, fires, explosions and accidents. They indicated that this information concerning operational history is relevant but is not included in the draft EA on DOE's response to build and operate a BSL-3 facility. Commenters also stated that the CDC is more qualified than LLNL and they should be handling the BSL-3 research. Commenters expressed the opinion that issues of safety of lab operations are especially important in light of the February 2001 DOE Office of Inspector General (IG) report entitled "Inspection of Department of Energy Activities Involving Biological Select Agents." Some commenters also felt that it is "a huge leap between BSL-2 and 3 facilities" and that "safety measures and procedures… are vastly different, as are the risks." Another commenter stated in reference to the IBC that "there is no indication whether there will be a process to guarantee full public scrutiny of committee deliberations."

Comments on the Revised Draft EA did not express any new concerns or provide information that was new and pertinent to the safety of laboratory operations. However, DOE received additional comments after the public comment period regarding the laboratory-acquired

infections. In response, additional information discussing laboratory-acquired infections since 2002 was provided in Section 4.2.2.2 "Analysis of Abnormal Events and Accidents for Facility Operation".

Response

Since it was founded in 1952, LLNL has been managed by the University of California. While mistakes, accidents, leaks, and spills will inevitably occur, LLNL is committed to providing employees and the community with a safe and healthy environment. LLNL has had an infrequent history of incidents and none has resulted in a significant impact to the public or the environment. In 2000, DOE's Integrated Safety Management System (ISMS) was implemented at LLNL, resulting in better safety practices and greater safety awareness. A DOE Verification Team inspected safety procedures at 25 facilities across the Laboratory, reviewed over 700 supporting documents, and determined that LLNL effectively implemented ISMS. The response to comment 11 (Waste Disposal) below discusses LLNL's compliance with permit limits for discharges into the sanitary sewer (between 99 and 100 percent compliance from 1996 to 2000) and LLNL's record of inspections for compliance with the California Medical Waste Management Act. As discussed in Section 4.1.2 of the Draft EA, LLNL has operated BSL-1- and BSL-2-equivalent laboratories for the last 20 years without any infections associated with their operations and no unintentional releases to the environment or to the public.

The CDC, which is part of the Department of Health and Human Services, provides guidelines for the operation of BSL-3 facilities, registers facilities that will access, use and transfer select agents, and then periodically inspects these facilities during operation. The CDC through the Antiterrorism and Effective Death Penalty Act of 1966 (See Appendix A-2) controls the transfer and receipt of select agents. As described in Appendix A-1, each successive CDC-defined biosafety level builds upon the previous level practices, safety equipment (primary barriers), and facility requirements (secondary barriers). These practices go, for example, from limited access to controlled access, decontamination of only "needed waste" to all waste, and defining medical surveillance requirements to requiring specific baseline serum. Safety equipment requirements for BSL-2 and BSL-3 laboratories are the same, except that in a BSL-2 facility the biosafety cabinets (BSC) are required only for manipulations of agents that cause splashes or aerosols of infectious materials. In a BSL-3 facility all open manipulations are conducted in a BSC. BSL-3 laboratories within facilities need physical separation of areas, self-closing double-door access, and controls on ventilation systems that do not permit air recirculation and have negative airflow into BSL-3 laboratories. BSL-2 laboratories do not have these requirements. Therefore, the engineering controls built into a BSL-3 facility are significant, but there is not a huge technological difference between a BSL-2 facility and a BSL-3 facility. LLNL institutionally uses the same types of facility controls in its other facilities.

CDC laboratories perform work that is different from the research work performed at LLNL. The CDC contracts with DOE and NNSA facilities, as well as with other government and private facilities (due to their capabilities), to perform much of its needed research work, rather than duplicating the research expertise of these agencies within the Department of Health and Human Services. While it is the opinion of some commenters that only the CDC should perform this work, this is neither cost effective nor practical. (Safety measures are discussed further under the response to comment topic 5).

The IG report cited by the commenters (DOE/IG-0492 dated February 2001) states at the beginning of the Observations and Conclusions Section: "We found no evidence that the Department's current biological select agent activities have adversely impacted the safety and health of DOE and contractor employees or the public". The IG observed that the Department had not developed and implemented policies and procedures that establish clear roles and responsibilities for the conduct of activities involving biological select agents and select agent materials. Additionally, the IG stated their opinion that the Department had not ensured that DOE laboratories, including those managed by the NNSA, follow "best practices" for the operation of these facilities. The concluding section of the IG Report, "Inspector Comments", contains the statement: "We believe the corrective actions identified by the Department are responsive to our recommendations." By the date of issuance of the IG report in February 2001, the DOE had already corrected identified problems associated with its management of facilities at which biological select agent work is conducted. At the time of the IG inspection, LLNL had already incorporated the provisions of the CDC/NIH Guidelines into its work standards for operation of its BSL-2-level facilities and was compliant with its provisions. The IG report had no adverse findings with regard to LLNL activities involving operation with biological select agents. DOEs operating contract with the University of California (UC) also requires that LLNL implement the CDC/NIH Guidelines through their Work Smart Standards and their ES&H Manual.

The currently established Institutional Biosafety Committee (IBC) will have authority over approving projects conducted at the proposed BSL-3 facility at LLNL, as it does for current BSL-1 and BSL-2 operations at LLNL. (The role of the IBC is discussed further under the response to comment topic 4 below.) NNSA will maintain strict adherence to the CDC and NIH guidelines for operating a facility of this nature. DOE oversight actions would also continue to be responsive to the recommendations made by the IG report.

(Additional responses related to safety are discussed under comment topic 5 and security measures are addressed in comment topic 7 below.)

3. DEFENSIVE- VS. OFFENSIVE-ORIENTED RESEARCH

Several commenters expressed their concerns about siting a BSL-3 facility at a nuclear weapons design lab. The commenters questioned how the DOE would prove that this new work with bio-agents is defensive and would not be used in the future for the manufacture of biological weaponry. The commenters expressed their opinions that the proposed culture of some organisms (*Brucella spp., Coccidiodes immitis*) suggests the potential development of agents that could aid U.S. offensive military operations. Commenters also expressed concerns about collocating a BSL-3 facility close to the existing LLNL Environmental Microbial Biotechnology Facility (EMBF), suggesting that it implied existence of future operation of an offensive biological weapons program at LLNL. The commenters were of the opinion that, since the EMBF is a biological fermentor with a capacity in excess of 1500 liters, the facility could be used for industrial-scale production of biological select agents with weapons applications. Commenters cited the proposed production of up to one liter of biological agent at the BSL-3

facility as excessive for defensive research purposes, suggesting that gram or sub-gram quantities of any agent are sufficient for such research. The proposed rodent aerosol challenge tests prompted commenters to infer that this would necessitate weaponization of agents and could pose increased dangers to workers and the public. It was the commenters' opinion that the Draft EA failed to address the risks posed by the aerosolizing, or as the commenter alleges: "weaponization." Another commenter stated that the proposed facility is not a small facility based upon CDC definitions (42CFR72.6(j)). One commenter expressed the opinion that, in addition to a Programmatic NEPA review of DOE's biological warfare defense research, a Nonproliferation Impact review should be conducted.

Commenters expressed similar concerns about the Revised Draft EA. Several commenters noted that other NNSA documentation describing the BSL-3 Facility list storage capacities of up to 25,000 2 ml vials and expressed a concern that the total capacity of the facility is therefore 100 liters of biological material.

In other commenter's opinions, the Revised Draft EA should include a Nonproliferation Impact Review that includes public participation because "This open process is critical because intent really is the biggest differentiating factor between defensive and offensive biological research."

Response

NNSA acknowledges that many people are opposed to the research, development, and testing of nuclear weapons, weapons research, and testing using live microorganisms. However, Congress directs DOE and NNSA with regards to the missions, and work performed at their facilities must support congressionally mandated missions. Similarly, the Department of Defense (DoD) must respond to its Congressionally assigned missions. Departmental mission support activities have necessitated biological research projects in the past, and this requirement will likely continue into the future for elements of both departments. As discussed in the response to comment topic 1 above, defensive biological research is ongoing at LLNL, is performed in support of DOE and NNSA mission requirements, and would not be inconsistent with existing DOE mission work.

NNSA also acknowledges that certain individuals might see the proposed BSL-3 facility as adding to the perception that the U.S. plans to prepare bioweapons for development of an offensive capability. However, the U.S. is a signatory to the Biological and Toxins Weapons Convention Treaty and has agreed that this nation shall not perform the actual development and production of bioweapons. Additionally, all such U.S. offensive capabilities were destroyed and offensive-oriented research was halted after the 1969 Presidential decision. Nonetheless, if the U.S. were indeed now planning a major departure in its 33-year-old policy on offensive capabilities, such work would require a facility with different functional capability and of a larger size than the proposed three-laboratory room BSL-3 facility. The microbiological research sample preparation equipment being proposed for the LLNL BSL-3 laboratory would not be the correct type needed to support a bioweapons production facility. Unlike the proposed BSL-3 facility at LLNL, a bioweapons production laboratory would require much more floor space to accommodate a sizeable worker staff and multiple pieces of specialized equipment. DOE does not now, and does not propose to, conduct research or engage in preparation or production of biological materials or toxins for potentially offensive use or purposes at LLNL and it would not be allowed under the Biological Weapons Convention.

It is true that a number of organisms that could potentially be used in research at the proposed BSL-3 facility, including the organisms mentioned by the commenter, could have offensive uses. But research currently being conducted by LLNL and proposed research in a BSL-3 facility would be for defensive purposes. For example, work conducted at LLNL by the Biology and Biotechnology Research Program (BBRP) in 2001 was focused on two areas: advanced detection systems to provide early warning of an attack; to identify the populations at risk, contaminated areas, and facilitate prompt treatment; and to develop DNA signatures and biological forensics technologies to identify the agent, its geographical origin, and/or the initial source of infection. Work in the proposed BSL-3 facility is limited to quantities less than 10 liters (working with over10 liters of culture quantities defines the NIH threshold for a "large-scale research or production" facility). The proposed BSL-3 facility and its operation would be limited to less than 1 liter of cultured microorganisms as the maximum quantity handled in any BSL-3 laboratory room at any point in time. Some research that the proposed facility would conduct requires growth media of up to "liter-size" quantities in order to have sufficient material from which to extract enough genetic material to conduct certain types of genetic research such as that involving messenger RNA. Additionally, organisms such as Coccidiodes immitis, already being investigated by LLNL, are locally important (Valley fever or San Joaquin fever) and research on this is public health related and extremely important to California and the nation at large. DOE believes that work conducted in the facility will not lead to proliferation of offensive biological weapons capabilities and that the EA makes it clear that the proposed facility is not designed as a production facility for offensive research or weapons production. With regard to the additional need for a "Nonproliferation Impact Review" the NNSA is of the opinion that none is required. While NNSA will ensure that the proposed facility would comply with the BWC there is no formal process requiring a "Nonproliferation Impact Review" per se and therefore none would be implemented by the NNSA.

There is no affiliation between the EMBF's 1500-liter fermentor and the proposed BSL-3 facility. The EMBF was established for the investigation, development, and growth of microorganisms that have environmental remediation applications. The facility can also be used for other biotechnological studies, such as the production of microbial pharmaceuticals and food additives. However, the facility is not suited for activities involving pathogenic organisms. BSL-3 facility protocols and engineering and design requirements in conformance with CDC guidance are quite stringent (CDC Biosafety Level Criteria are included in Appendix A-1 to this EA). The EMBF is <u>not designed</u> to meet these BSL-3 criteria, is not being proposed for operation at the BSL-3 level, and would not be easy to retrofit to meet these criteria. Also, as noted earlier, all biological work conducted at LLNL must be reviewed by the Laboratory Biosafety Operations Committee (LBOC) and, when involving pathogenic organisms specifically, reviewed and approved by the IBC. Work that is not in conformance with federal regulations, CDC/NIH Guidelines, DOE Orders, and LLNL directives cannot be performed because it would not be approved by the IBC and would not be in conformance with provisions of the U.C. contract with DOE.

The term "weaponization" in reference to biological agents can be broadly defined as "the design, and production and storage in large quantity, of biological agents and their delivery systems for military purposes." This is not being done at LLNL, and is <u>not</u> a part of a DOE

proposal. Aerosol challenges do not imply "weaponization". An aerosol challenge is the method used to test a rodent by inhalation. The route of pathogen exposure affects the timing for onset of symptoms and it is the inhalation pathway that is one of the quickest. Aerosol challenge allows for testing of detection assays, treatment regimens, and medical intervention approaches as a consequence of inhalation exposures to pathogens. Nebulizers used for challenging test animals are frequently employed in private industry, including in the research and development of cosmetic products. The research proposed for the BSL-3 facility would involve growing and culturing agents, and in some cases challenging rodents by means of administering agents with a nebulizer. Again, no technology is being proposed, developed, or adapted at LLNL for the purpose of "weaponizing" agents.

LLNL has no intention, and would be prohibited under Title 18 of the U.S.C., of developing or producing biological materials for weapons use, often referred to in the media as "weaponizing". The prohibition against developing or producing biological agents for weapons is taken seriously at Livermore. All proposed research with pathogens, even non-select agents, regardless of the specific biological laboratory to be used is reviewed and evaluated in a multi-step process that ultimately requires directorate-level approval. This process is designed with checks and balances to ensure that scientific research is conducted legally, securely, within the staff's and the respective facilities' technical capabilities, and above all, as safely as possible. Conducting microbiological and toxin research at LLNL furthers the Biological and Toxin Weapons Convention (BTWC) goal of ensuring the security of potential biological weapon source material. The proposed LLNL facility would be one of the most secure BSL-3 facilities in the United States, and many times more secure that similar commercial facilities existing currently in the Bay Area or anywhere else in the world.

Because of the potential asymmetrical biological weapons threat, the United States is allowed, under the BTWC and U.S. Law, to conduct defensive bona fide *scientific research with potential biological weapon pathogens known as "select agents". This research would include what is known as "basic research" that could, for example, investigate the genetic linkage between Bacillus anthrasis (BA) and its "nearest neighbors" (e.g., B. cereus and B. thuringiensis) or examine genetic anomalies in the BA so-called "sub-specie" variants know as the Sterne and Vollum strains. Other research could, for example, process vegetative and spore cells to evaluate processes which might affect detection equipment's ability to identify genetic or chemical "markers" necessary to confirm the presence of microbial pathogens or toxins. Procedures or processes used to conduct this scientific research are the same or similar to those commonly used throughout biosafety laboratories in the government, public and private sectors. None of this research constitutes developing or producing biological materials for weapons use.*

Furthermore, LLNL has a major role in the CDC's Laboratory Response Network (LRN) to provide the highest level of analytical sophistication for purposes of identification and confirmation during disease outbreaks or bioterrorist attacks from suspected select agents. LLNL may also need to support other government agencies to provide forensic analysis to track down those suspected of perpetrating bioterrorist acts. Being able to accurately identify genetic or chemical attributes of microbial cells and toxins may be a crucial step in determining protective measures such as medical prophylaxis. As with the research that supports it, this capability would not constitute developing or producing biological materials for weapons.

The characterization of the potential inventory in the BSL-3 by several commenters is in error. LLNL has no plans to have 100 liters of a slurry of biological agents in any single laboratory at any one time. Most research involves a few milliliters of material in growth solution. LLNL plans to store samples of biological agents, including select agents, in small vials, most of which are 2 ml. The facility limit is 25,000 vials, so the maximum volume of the vials is closer to 50 liters, not 100 liters. Typically, less than 2 ml of sample is stored in any vial so the aggregate total volume of all samples would be significantly less than 50 liters. These vials are stored in -80 degree freezers in three separate laboratories in frozen form, not as aggregate liquid slurry. As noted above, only 1 liter would be handled in any laboratory at any one time.

The DOE does not operate a national biological research program. Individual research efforts are managed at DOE sites on behalf of non-DOE sponsors as "Work for Others". The DOE has established a Biosurity Executive Team, a national level working group, to recommend the establishment of biosurity-related policies, regulations, requirements, and standards. This comment will be forwarded to the Chairman of that group for consideration.

4. COMPLIANCE WITH BIOLOGICAL WEAPONS CONVENTION

A commenter expressed concern that the proposed work would undermine the Biological Weapons Convention and be viewed with suspicion by the world community. Additionally, the commenter remarked that the draft EA gives no indication of how BWC compliance would be instituted. Several commenters were of the opinion that the draft EA does not provide a process to guarantee public scrutiny of the LLNL biosafety committee deliberations and decision making.

Several commenters reiterated concerns that research in this facility could be construed as violation of the Biological and Toxin Weapons Convention since it is located in a secure weapons laboratory and oversight by the Institutional Biosafety Committee (IBC) is less than "transparent".

Response
U.S. participation in the Biological Weapons Convention is discussed under topic 3 above.

The proposed BSL-3 facility would be operated according to all guidance and requirements established by such agencies as the CDC, NIH, USDA, DOE and LLNL. Specific guidance references are detailed in Section 2.1.2 of this EA. NIH guidelines require that an IBC be appointed by an institution to provide local and institutional oversight and approval of potentially hazardous lines of biological research (NIH 2001). Section IV-B-2 of the NIH guidelines establishes procedures that the IBC shall follow in its role of review and approval responsibility. These guidelines include review and approval of applications, proposals, and activities; and making available to the public, upon request, all IBC meeting minutes and any documents submitted to or received from funding agencies that those agencies must make available to the public. As detailed in this EA and in the NIH guidelines, at least two members of the IBC are not affiliated with LLNL and they represent the interest of the surrounding

community with respect to health and protection of the environment. These IBC members may be officials of state or local public health or environmental protection agencies, members of other local governmental bodies, or persons active in medical, occupational health, or environmental concerns of the community. Since the IBC is ultimately responsible for ensuring that research conducted at, or sponsored by, LLNL is in compliance with applicable guidelines or regulations, this ensures that the public will be involved in approval of BSL-3 research and review of safety and compliance protocol as it does now for certain BSL-2-level projects. It is possible that some specific project information will be subject to DOE security and classification restrictions, and will consequently not be made available to the public. All proposed microbiological research projects at LLNL, even projects with classified portions, will undergo review and approval by the IBC.

The IBC was established at LLNL in 1991 to ensure compliance with recognized guidelines and regulations concerning research with recombinant DNA or human, animal, and plant pathogens. In 1998, the IBC registered LLNL under the Laboratory Registration and Select Agent Transfer Program of CDC. As currently practiced at LLNL, the IBC must approve all research in the cited subject areas prior to commencement. Details regarding the procedures for choosing committee members and other IBC functions are not within the scope of this environmental review.

5. PUBLIC HEALTH AND SAFETY, AND WORKER SAFETY ISSUES

Comments regarding the issue of public health and safety ranged from general opposition to a BSL-3 facility at LLNL to specific concerns about the potential for accidents and the implementation of procedural safeguards. One commenter remarked that there was no evidence that LLNL conducted a preliminary hazards analysis for the proposed facility and another commenter stated that it was inappropriate to allow biological warfare agent research so close to a major population center. Commenters also expressed the opinion that anticipated work with genetically modified organisms would pose unique or unknown risks to the general public, emergency personnel, and regional medical workers. Commenters expressed concern about how LLNL would respond in the event of an accident at the BSL-3 and how the lab would notify the public and provide information on emergency response actions during an accident.

One commenter remarked that the Draft EA failed to address the effect that a release or exposure could have on the way a region functions. The commenter cited the anthrax attacks of 2001 as an example of the difficulties of determining the nature and extent of a hazard and the potential for entire facilities to close down, despite a relatively small number of casualties. One commenter stated an opinion that the immunization status of laboratory workers represents critical information that should be available to all employees of LLNL and residents of the area.

Comments on the Revised draft EA expressed concern that it does not adequately analyze the health impacts of a release of the the BSL-3 facility's total inventory of up to 100 liters or 25,000 different samples of pathogens.

Response

A Preliminary Authorization Basis Document (analogous to a preliminary hazard analysis) would be completed and approved by NNSA prior to the facility being constructed. A Final Authorization Basis Document (analogous to a final hazard analysis) will be completed and approved by NNSA prior to the facility becoming operational. As for emergency response, the scope and extent of emergency planning and preparedness at LLNL are based on, and commensurate with, the hazards and potential consequences associated with a facility and its operation. The Laboratory uses an emergency management system (known as the Incident Command System) that is capable of responding to and mitigating the consequences resulting from operational emergencies. Under this system LLNL coordinates with Livermore Police and Fire Departments who in turn notify the public during emergencies. The emergency management system also incorporates provisions and procedures for dialogue with and involvement of local area law enforcement, fire, emergency response agencies if necessary. Emergency response procedures are documented in the LLNL Environment, Safety & Health (ES&H) Manual. The requirements in the ES&H Manual are based on the Work Smart Standards (WSS) identified for the specific work and associated hazards and LLNL best practices that management has determined are requirements. The WSS set was derived from statutes, regulations, DOE Orders, and national and internally developed consensus standards. The ES&H Manual also describes the implementation of the ES&H management commitments made in the Laboratory's Integrated Safety Management System Description. Adherence to the requirements and processes described in the ES&H Manual ensures that safety documents across the Laboratory are developed and updated in a consistent manner.

NNSA is confident that the proposed BSL-3 facility at LLNL can be operated safely and securely.

The day-to-day functions of the proposed BSL-3 facility, and potential increase in the number of biological material shipments to and from the proposed BSL-3 facility do not portend a significant increase in the possibility of human health risks to workers or the public beyond those related to LLNL's current ongoing, routine, BSL-2-level activities.

The safe operation of over 250 BSL-3 facilities within the U.S. substantiates the analysis presented in this EA with regards to this issue. There are on the order of 40 BSL-3 facilities currently operating under the control of the University of California. Several of these are nearby at the UC San Francisco and UC Davis campuses. Representatives of the CDC are authorized to periodically inspect all BSL-3 facilities. When operational, CDC and NNSA would regularly inspect the BSL-3 facility at LLNL.

In reference to the immunization status of workers at LLNL, the information would be made available to proper authorities, such as the CDC. The immunization status of individual workers is part of their personal medical records and, as such, cannot be released to the general public. However, to reiterate from the EA (Section 2.1.2, Operations, pg 18), "Workers would be offered appropriate immunizations for the microorganisms being handled." Information about what immunizations are being offered to BSL-3 laboratory workers would be available from the regular meeting minute records of the IBC, as that pertains to controlling risk associated with proposed research. In the event of unusual epidemiological occurrences involving

communicable diseases, information about the medical condition of affected workers would be made readily available to CDC and other authorized public health officials.

As explained in Appendix C, section 3, the facility will not have 100 liters of pathogens available for release. It will likely take years, if ever, to approach the facility's 25,000 sample-vial physical storage limit. Also as stated earlier, volumetrically this accounts for less than 50 liters of material in a frozen state. Pathogens in the BSL-3 facility that are in liquid or slurry form would account for much less than the facility's 10-liter limit because of each individual BSL-3 laboratory's 1-liter liquid-slurry culture limit. This would be further reduced because each BSL-3 laboratory would not normally process volumes even close to the 1-liter restriction. Therefore, the release potential is consistent with the analysis of this EA.

6. ACCIDENT ANALYSIS

Several commenters expressed the opinion that the Draft EA lacks a comprehensive analysis of earthquakes, and should address local and regional fault zones. Commenters called for a more thorough analysis of release possibilities and outcomes from seismic risks, as well as other natural disasters. One commenter expressed concern about the vulnerability of a prefabricated building versus that of a conventionally constructed building.

Several commenters pointed out that a 50-mile radius around LLNL embraces more than 7 million people as opposed to the 1.3 million stated in the Draft EA. Given the density and proximity of nearby populations, the commenters were of the opinion that the Draft EA lacked appropriate modeling for accidental releases. Commenters questioned the appropriateness of using accident scenario data related to operation of the U.S. Army Biological Defense Research Program (BDPR) or that of the existing BSL-2 labs operated by LLNL. The commenters stated that the U.S. Army has a long history of operating a BSL-3 facility, and neither DOE nor LLNL has comparable experience.

Commenters expressed the opinion that the Draft EA understated the potential risks of worker exposure, as well as subsequent potential risks of off-site transmission of diseases. Further, several commenters remarked that the process of aerosolizing agents could substantially increase the risk of release and exposure, especially in light of the quantity (up to one liter) of medium containing pathogens that would be permitted. Commenters were of the opinion that the Draft EA does not address the potential for failure of filter systems and called for a more complete analysis of the potential for HEPA filter failure. These commenters alleged that DOE has a poor record of maintenance with regard to operating HEPA filters in some of its nuclear facilities. Further, the commenters state that the Draft EA makes claims for the protective qualities of HEPA filters that exceed the documented record, citing DOE reports that the efficiency of HEPA filters for capture of particles in the 0.1 micron size range is less than the efficiency for the 0.3 micron-sized particles discussed in the Draft EA.

Commenters on the Revised Draft EA reiterated many of the opinions stated above regarding accident analysis. Commenters stated that that "new research by the USGS has determined there is a 62% chance that one or more magnitude 6.7 earthquakes will occur in the area within the

next 30 years", and "Other studies predict a quake with MM 10 shaking in the Livermore area (which is very violent – the scale is 1 to 10)." One commenter expressed an opinion that the maximum ground surface acceleration at return intervals of 500 and 1,000 years could be much greater that the values presented in the Draft EA of 0.38 g, and 0.65 g, respectively, and significant surface displacement is also possible. One commenter also cites the Parkfield Earthquake of 2004 which produced two recorded ground acceleration values of 1.13g and 1.31g as "evidence" that the evaluation of seismic hazards at the Livermore Site is in error. Many commenters noted that the BSL-3 Facility is located in the Bay Area which has a population of 7 million.

Commenters expressed concern regarding the testing and maintenance of HEPA filters and their potential for failure. One commenter claimed that "HEPA filters at LLNL are flimsy, weak, fiberglass, paper and glue structures mounted in wood or metal frames that can fail completely when wet, plugged, hot and over pressured from fires, explosions, blowers and even severe storms." and "even under optimal conditions, HEPA filters are unable to effectively contain all bio-agents measuring between 0.03 and 0.3 micrometers."

Response

The BSL-3 facility would incorporate design considerations for the occurrence of natural phenomena as appropriate for the LLNL site. The facility would be designed to the latest Performance Category 2 (PC-2) requirements of DOE Standard 1020-2002. Specifically, the seismic design would conform to the 2000 International Building Code, Seismic Use Group III, Criteria 2/3, MCE Ground Motion with an Importance Factor of 1.5. It would be operated under the requirements of LLNL ES&H Manual, Volume II, Part 10, Supplement 27.02, Earthquakes. According to Supplement 27.02, all structures over 5 feet in height must be seismically secured. Furthermore, incompatible materials must be segregated to mitigate spills that could cause chemical or biological releases, as well as fires or explosions due to chemical incompatibility.

Based on the 2002 seismic hazard evaluation for LLNL by J. B. Savy and W. Foxall, a 1.0g ground acceleration has a mean annual exceedance probability of $2x\ 10^{-4}$ (5000yr return interval). The probability that this (or a greater) ground motion will be experienced during the operational life of the BSL-3 facility (30yrs) is approximately 0.6%. To put this into perspective, the ground motion levels typically used for the design of standard buildings have a 10% exceedance probability over the presumed 50 year life of the facility (500 year return interval event) and an equivalent 5% exceedance probability over the life of high-hazard/toxic/critical facilities (1000 year return interval event). In NNSA's opinion, a 5% exceedance probability over the life of the BSL-3 facility would represent an acceleration level that may "reasonably" be expected to occur. For the BSL-3 facility, the ground motions used for design from the 2000 International Building Code (IBC), Seismic Use Group III, are 0.69g peak ground acceleration and 1.73g maximum spectral acceleration (a 1250 year return interval event), and would have an approximately 2.5% chance of being equaled or exceeded during its 30 year operational life. The "Maximum Considered Earthquake Ground Motions" specified for use in the 2000 IBC have been characterized by the Building Seismic Safety Council, as "the maximum level of earthquake ground shaking that is considered as reasonable to design structures to resist" (FEMA 303, 1997 edition, "NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures", Part 2- Commentary).

The Parkfield Earthquake of 2004 produced two recorded ground acceleration values of 1.13g and 1.31g. However, accelerations in this range (and higher), at similar epicentral distances and from similar magnitude events are in fact included in the 2002 probabilistic seismic hazard analysis for LLNL by Savy and Foxall, and by the USGS in the determination of Maximum Considered Earthquake events, but have a low probability of occurring at LLNL. The 2002 seismic hazard study for LLNL indicates a mean estimate for a 1.31g ground motion occurring at the LLNL Site of approximately $5x10^{-5}$ annual probability of exceedance (an approximately 20,000yr return interval event). As such, this represents a level of conservatism in excess of that required for the seismic design of nuclear power plants (10,000 year return interval per ASCE 43-05 "Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities"). Furthermore, the occurrence of a single event on a distant fault system (approximately 180 miles from LLNL) should not form the basis for seismic design decisions at the Livermore Site.

There is no "recent history" of earthquakes in the area of LLNL producing ground motions at LLNL anywhere near this level observed for the Parkfield earthquake, which was a non-event for the Livermore site as it was approximately 180 miles distant. The 1989 Loma Prieta earthquake produced recorded ground accelerations at LLNL having a maximum value of approximately 0.15g. The maximum historic earthquake on the Greenville Fault (M5.8) occurred on January 24, 1980 (D.W. Carpenter, et al, August 1984)[1] and produced ground accelerations of approximately 0.3g at LLNL.

In NNSA's opinion, the Greenville Fault poses a "significant" but not "extreme" hazard to the Livermore site, and is not "easily" capable of producing severe earthquakes capable of serious damage to the proposed BSL-3 facility within its projected life, as the commenter suggests. The 2003 USGS Open-File Report 03-214 on "Earthquake Probabilities in the San Francisco Bay Region" gives only a 3% mean probability that the Greenville Fault will produce a major, damaging earthquake ($M \geq 6.7$) during the next 30 years, which in DOE's opinion does not rise to the level of an "extreme" earthquake hazard. The expected magnitude from a rupture of the entire length of either one or both segments of the Greenville faults is about 7 to 7.1. Such events are expected to produce Peak Ground Acceleration (PGA) values of about 0.5g at sites very close to the fault. Larger amplitudes are possible but not likely. For example, the attenuation model of Abrahamson and Silva (1997) predicts that there is less than a 10% chance of a ground motion as severe as 1g (PGA) even if a magnitude as large as 7 occurs on the Greenville fault. In any case, the earthquake hazard posed by the Greenville Fault, as well as other faults, is incorporated into the design parameters used for this facility.

The surface rupture that occurred during the 1980 Greenville earthquake did not occur within the LLNL site and surface rupture within the LLNL site would not be expected to occur in the event of future earthquakes. Studies to identify active faults in the vicinity of LLNL are described in Carpenter et al. (1984). These included literature reviews, photographic analyses, geologic mapping, shallow and deep borings, excavation of pits and trenches, and soil dating. The objective of these studies was to identify physical properties (e.g., location, length, dip) of the tectonic faults in the vicinity of LLNL, and to determine the likelihood of current seismic activity.

[1] May not be in the Revised EA

The result of these studies was that "No evidence of slip was found in all of the investigations for active faulting (within the last 300,000 years) within the LLNL Site", J.F. Scheimer, et al. (May 1991). Furthermore, the proposed location of the BSL-3 facility does not fall within the requirements of the Alquist-Priolo Special Studies Zones Act of 1972 which required the State Geologist to "delineate appropriately wide special studies zones to encompass all potentially and recently active traces of the San Andreas, Calaveras, Hayward, and San Jacinto Faults, and other faults, or segments thereof, as he deems sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep."

The "activeness" of a fault is typically described in terms of earthquake recurrence relationships which express the expected number of earthquakes per year having magnitudes greater than some minimum value, and less than some maximum value. Recurrence relationships for fault sources are a function of long-term geologic slip rates, not number of aftershocks. The Greenville Fault has been assigned a slip rate of 2±1mm/yr in the USGS Open-File Report 03-214. This is a relatively low slip rate indicative of a low rate of fault activity as compared, for example, to the San Andreas Fault which has been assigned a slip rate of 17±4mm/yr to 24±3mm/yr (depending on segment) in the same report. This is a much higher slip rate and consistent with the greater level of seismic activity on the San Andreas Fault.

The description of potential damage to the BSL-3 Facility as a result of an earthquake is taken from FEMA 303 "1997 Edition, "NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, Part 2- Commentary", for buildings designed in accordance with the requirements for Group III structures subjected to the Design Ground Motion. Additionally, the seismic design provisions inherent in the 2000 IBC are intended to provide a margin of safety against the occurrence of larger, less probable earthquakes. As a minimum, a margin of about 1.5 times the design earthquake ground motion is provided. In other words, "if a structure experiences a level of ground motion 1.5 times the design level, the structure should have a low likelihood of collapse. This margin is dependent on the structure type, detailing requirements, etc., but the 1.5 factor is a conservative judgment appropriate for structures designed in accordance with the code provisions. Also, the Parkfield Earthquake report states that the damage experienced as a result of this earthquake, was only "minor nonstructural damage" (e.g., cracking of stucco and drywall, collapse of wood pile, broken windows, fallen bookcases, the separation of a timber canopy from a house, and a portion of an unreinforced masonry parapet wall collapsed). These were built with brittle materials (e.g. stucco and drywall). Structures that were designed or retrofitted for earthquakes showed minor to no damage. A masonry chimney that had been retrofitted by strapping it to the house showed no damage. Local bridges showed minor to no damage and were open with immediate occupancy post event. Buildings such as the BSL-3, with structural steel framing and bracing would have had negligible structural damage due to such an earthquake.

Personnel injuries at LLNL following the January 24, 1980 earthquake consisted primarily of lacerations, sprains, bruises, back problems, and other minor conditions that were treated by first aid. One employee suffered a heart attack while riding a bicycle an hour or so after the earthquake, and was treated at Livermore's Valley Memorial Hospital. Property damage at LLNL (initially estimated to be up to $10 million dollars) was actually less. No bricks fell from chimneys at LLNL as there were no brick chimneys at the Lab, and little damage was done to the

water lines. After the earthquake, main gas valves were closed and the main lines pressurized and checked for leaks. No leaks were found in the main system, although some leaks were found in building systems and were repaired.

Ground accelerations can be and often are amplified within the overlying building structure. This amplification effect is accounted for in the use of the 2000 International Building Code, Seismic Use Group III design criteria, which incorporates a design response spectrum having a spectral amplification factor of 2.5. It should be pointed out that the example given from the Geomatrix report is exceptionally conservative. A two percent damping level in a structure experiencing ground accelerations of 0.9g is unrealistically low. There is a wealth of data that shows that structures experiencing strong ground motion develop damping levels well in excess of two percent. A damping value of five to seven percent would be much more appropriate (and still conservative) for the BSL-3 structure at a 0.9g ground acceleration level. Increased damping would significantly reduce the maximum spectral accelerations experienced by the structure. For example, the maximum spectral acceleration of the Newmark-Hall median spectrum (NUREG CR-0098), anchored at a peak ground acceleration of 0.9g, at two percent, five percent, and seven percent of critical damping is 2.47g, 1.91g, and 1.70g respectively.

The BSL-3 facility is a safe facility, appropriately designed to withstand the effects of earthquakes, and the DOE Standards and Guides used to establish the Performance Category-2 design level for the BSL-3 facility were appropriately followed. The 2000 IBC Seismic Use Group III criteria is the appropriate design criteria for this facility per DOE Standard 1020-2002, and includes criteria for the design of facilities that house substances deemed to be hazardous to the public if they are released. The 2000 IBC utilizes ground motions for design that include the contributions to the site from all relevant earthquake sources, conservative factors of safety, and prescribed detailing requirements for ductility (toughness), to ensure the seismic safety of this facility in the event of a major earthquake. Additionally, the seismic design provisions inherent in the 2000 IBC are intended to provide a margin of safety against the occurrence of larger, less probable earthquakes. Based on these considerations, we believe the chance of any release of pathogens due to seismic activity to be exceptionally low.

In order to obtain a significant margin of safety a peak wind gust of 91 mph would be used as the design wind load, although it is an extremely unlikely event. Flooding is not a design consideration at the LLNL site, per the DOE's Final Environmental Impact Statement and Environmental Impact Report for the Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore [DOE, 1992]. Prefabricated modular units, if used for the proposed BSL-3 facility, would be required to be constructed to standards equal to those for a permanent on-site constructed facility, including earthquake and ground motion standards.

The 2000 U.S. Census reports that Alameda County has a population of approximately 1.4 million people (Health Resources and Human Services [HRSA] 2000). The 2000 LLNL Environmental Report (LLNL 2001b) states that there are 6.9 million residents within an 80-km (approximately 50-miles) radius of the LLNL site. The EA will be changed to add the population of the 50-mile radius from LLNL.

The U.S. Army has been doing biological defense work for years, operating under the same safety protocol and CDC and NIH-developed guidelines as would be applicable at the proposed LLNL BSL-3 facility. This EA describes the Army's extensive experience working with hazardous infectious organisms and references their outstanding safety record to provide a perspective on the adequacy of following these guidelines in the safe operation of its facilities. The DOE has also been involved in biological defense research at LLNL and other facilities for years and has extensive BSL-2 facility experience. The BLS-2 laboratory staff at these facilities have safely handled many of the same agents that are proposed for handling in BSL-3 facilities. Highly trained individuals would operate the laboratory with modern equipment and in accordance with established nationally recognized guidelines and comprehensive oversight. Since 2000, LLNL researchers have safely worked with a number of strains of anthrax and plague at the BSL-2 level. The work has been conducted safely and in full compliance with all applicable security, health, and other administrative requirements and guidelines. NNSA is confident that DOE and LLNL have comprehensive and appropriate experience and trained personnel to safely operate the BSL-3 facility, and that potential risks to workers and non-workers have been adequately addressed in this EA.

The accident analysis scenario presented in the EA addresses the potential effects associated with an accident in which potential highly infectious cells would be disbursed into the environment from the proposed facility during its operation. Analysis of historical data related to the operation of other similar federal and industrial facilities shows that a significant release beyond the facility building is extremely unlikely to occur. The only releases that are probable would be contained within the building, which is a facility specifically designed for decontamination. Any accidental releases, if they occurred, would impact only a small area of the lab, which could easily be decontaminated. The likelihood of a wide area, city or population, effect should be considered improbable. The nature of the agents, dose/response potential, dispersion, the limited quantities involved, and the design of the building and safety protocols preclude a large-scale or widespread release potential. As described in the Draft EA, human pathogens for which there is no immunization or medical treatment available would not be handled in the proposed BSL-3 laboratory, in accordance with Biosafety in Microbiological and Biomedical Laboratories (BMBL) guidelines.

In June 1999, LLNL imposed lifespan limits on HEPA filters, found in UCRL-AR-133354 Rev 1, "HEPA Filter and In-place Leak Testing Standard", of 10 years from date of manufacture if the filter is in a dry location or five years from date of manufacture or testing if it is where the filter could become wet, such as during a fire suppression system discharge. The HEPA filter installation proposed for the LLNL BSL-3 facility would be in accordance with accepted good practice for biological safety as specified in the nationally accepted criteria for biological safety, the Centers for Disease Control and Prevention/National Institutes of Health, Biosafety in Microbiological and Biomedical Laboratories (CDC 1999). Testing of HEPA filters in biological safety cabinets is part of the BSC certification and would be done in accordance with the National Sanitation Foundation (NSF International) Standard 49 as noted by the CDC (CDC 2000b). Performance testing of the HEPA filters would be conducted by NSF-accredited field certifiers.

NNSA acknowledged in the LLNL Supplement Analysis for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore (March 1999, DOE/EIS-0157-SA-01) the issue of reduced removal efficiency of HEPA filters for particles in the size range from 0.1 micron to 0.3 microns. The study which provided this information was from a dissertation written by Ronald C. Scripsick (Los Alamos National Laboratory Report, LA-12797-T, 1994). Even though the most penetrating particle size in his study was slightly smaller than the HEPA filter "most penetrating design point" of 0.3 microns, his results still showed a 99.97% removal efficiency or higher in the range from 0.148 to 0.196 microns. These removal efficiencies are higher than the removal efficiencies used for the accident scenario in this EA and therefore the scenario conclusions are unaffected by recognizing a smaller most penetrating particle size.

HEPA filters on the building HVAC exhaust system are not required by the CDC for biosafety level 3 laboratories. However, LLNL has installed these HEPA filters as an additional measure of protection. Besides HEPA filters on the BSCs, the building exhaust system has three sets of HEPA filters. Each set has two HEPA filters in series. Two sets are in use at any time, with the third available as standby. The facility control system monitors pressure differential across the prefilters and the facility HEPA filters. If the exhaust fans are unable to maintain a constant static pressure across the HEPA filters at a specified set point, the supply fan and the exhaust fans will shut down, and all bubble tight dampers will be closed. Building alarms would be activated and building staff would respond to shift exhaust to the unused HEPA filter set. During this response time, the second HEPA filter would remain intact. Therefore, the failure of one of the HEPA filters would not result in loss of containment. In the extremely unlikely event that both building HEPA filters failed, all BSL-3 laboratory activities would be suspended, materials placed in "safe mode," and the HVAC system would be shut down until the situation could be corrected. This would ensure that no pathogens could be released from the facility.

NNSA does not believe research conducted in the LLNL BSL-3 facility presents either a new or undue risk to the population of the San Francisco Bay Area or California, in general. As noted in the previous response to comments, BSL-3 laboratories currently operate in many other Bay Area locations and throughout California. BSL-3 laboratories are commonly located in these and other urban areas such as Atlanta, Georgia, Fredrick, Maryland, and Galveston, Texas. Even though work is performed in these laboratories with indigenous or exotic agents that may cause serious or potentially lethal disease through inhalation route exposure, just as would be performed at LLNL, these facilities do not pose any undue risk to the surrounding communities. As noted in the EA, NNSA is not aware of any incidents in the San Francisco Bay Area, California, or elsewhere in the United States of infectious materials released from catastrophic accidents at microbiological laboratories. No such event has occurred in the more than 50 years in which the military has been conducting biological defense research activities (DA 1989).

7. THREAT OF TERRORIST ATTACK/SABOTAGE

Commenters expressed a general opinion that the Draft EA does not adequately address external or internal security issues, citing that no security analysis is included in the document. Concerns included the potential for unauthorized access, the potential for removal of biological agents by a

BSL-3 worker or other person, and the potential for a deliberate release of biological agents and subsequent risk to the surrounding community.

Commenters stated that the Draft EA does not address the possibility of terrorist attack, and in light of the September 11, 2001 events and anthrax mailings, consideration of terrorism and internal threats must be included in the NEPA analysis for the BSL-3 facility. One commenter stated an opinion that LLNL already represents a terrorist target and the addition of a BSL-3 facility, which the world may believe is for offensive research purposes, will exacerbate the threat of terrorism.

Commenters expressed many concerns regarding the adequacy of the terrorist assessment in the Revised Draft EA. Commenters expressed their opinion that the Ninth District Court ruling requires a full modeling of a release following a terrorist act and also a discussion of the public response measures. Several commenters doubted whether biological materials would be destroyed in a fire. Commenters expressed doubt about whether a terrorist would obtain biological materials from environmental samples if these materials were available in the concentrated or "milled" form they claim would be present in the BSL-3 facility. The adequacy of the building to withstand a terrorist attack and the competence of the security force were questioned by many commenters. One commenter doubted the EA's claim that stolen bioagents would not pose a serious risk to human health and safety citing the Anthrax Letter attacks in 2001. Another commenter questioned whether bleach would be kept in the same location as biological agents. In one commenter's opinion, freezers may pose a different type of environmental consequence and must be analyzed separately. One commenter expressed concerns that genetically modified organisms would have increased risk and survivability if there was an accidental release. Many commenters doubted the Revised Draft EAs assertion that the a release from the BSL-3 facility would pose a risk no greater than that posed from births of infected wild and domestic animals.

Many commenters stated their opinion that detailed evaluations of the consequences of terrorist acts must be conducted regardless of their probability of occurrence. Commenters suggest that it is possible to determine a general threat level for the facility. One commenter questioned why only three scenario's were chosen for evaluation. One commenter expressed concern that the "security concerns" prompting NNSA's removal of plutonium from LLNL should be considered in the EA. Many commenters expressed concern that locating a biological research facility at a nuclear weapons facility increased the likelihood of a terrorist attack.

In one commenter's opinion the Revised Draft EA "shirks genuine consideration of the impacts of terrorism by suggesting that because there are other BSL-3s in the U.S., the LLNL BSl-3 will not contribute much to an increased likelihood of an act of terrorism". The commenter compares this to a situation in which the Nuclear Regulatory Commission would avoid an in-depth review of the Diablo Canyon permitting action on the basis that there are other nuclear power plants in the country and so Diablo Canyon does not add much to the numeric likelihood of a terrorist attack.

Response

As stated in the EA, physical security and safeguards would be based upon a security analysis conducted during the appropriate project planning stage. As in all facilities managed at LLNL,

access is limited to only authorized DOE-badged personnel or under DOE-approved escort procedures. Safeguards would also be consistent with CDC/NIH guidelines. It would be imprudent to describe the specific security protocols in a public NEPA document as the commenter suggests. This is due in part to the relative high-security of the overall LLNL operations, and also to the limited and synoptic availability of significant quantities of viable pathogens due to the facility being focused on genetic research (on the parts of the microorganisms). Added to this is the extremely limited potential for a release of microorganisms from the multiple levels of bio-containment within the building. The level of security at LLNL and the uncertainty of available and viable microorganisms would preclude it from being a desirable or likely target for removal or theft of biological agents.

Historically, there have been at least two reasons why the potential results of terrorist attacks are not typically included in NEPA analyses. The first reason is that NEPA accident risk analysis is done for "reasonably foreseeable" accident events. While terrorist events are possible, these are not reasonably foreseeable accident events in the sense that a probability of occurrence could be determined for a NEPA analysis. This is not to say that NNSA does not evaluate possible terrorist actions and work to mitigate them. On the contrary, NNSA continuously strives to assess and remove potential threat opportunities. Secondly, regardless of the initiating event (whether naturally occurring, human-error, or malicious intent), the NEPA accident analysis scenarios presented in NEPA documents are generally bounding events for releases into the environment from the proposed facility.

Terrorist attacks come under the realm of security and therefore are appropriately evaluated in a separate risk assessment. That risk assessment would determine what security measures would be taken to protect the facility. This assessment document and its details are not available for public review since this would defeat the purpose by making all security measures public knowledge. Terrorists could then use this information to better plan for future attacks—something that no one wishes to facilitate.

NNSA believes that although a direct attack on the BSL-3 facility is possible using a commercial jet or a private aircraft, the result would be a fire that would destroy biological agents rather than dispersing them, and therefore it is not necessary to model such a release. An aircraft crashing into the proposed BSL-3 laboratory (the facility) could have different potential consequences depending on the scenario conditions, but would regardless result in the death of uncontained microorganisms. The range of conditions would be bounded by whether the aircraft were a larger-size jet or a much smaller propeller-driven aircraft. The former aircraft's size would demolish the facility and surrounding buildings on impact while the smaller plane might only cause a breach of containment. Fire would be a highly probable consequence under both conditions for reasons explained below. As will also be described, microorganisms whether vegetative cells or spores could not endure the temperatures of any fire resulting from these circumstances.

A large jet aircraft crashing into this facility would have the same result on impact regardless if the fuel tanks were full or nearly empty. Due to the plane's wingspan it would be almost impossible to not involve other surrounding buildings in the impact unless the plane approached from a nearly vertical angle. With fuel tanks full an aircraft impacting this facility would totally

demolish the structure (and surrounding buildings) in a conflagration nearly-reminiscent of the plane crashes into the World Trade Center towers or the Pentagon. The same aircraft crashing with fuel nearly exhausted would still break into flames due to ignition of fuel-vapor explosive gases released at impact. The only differences would be the amount of jet fuel burning at the impact site and the time it might take to extinguish the fire. Jet A fuel (>99% kerosene) would be the primary source of flammable material, but combustible materials from the plane and the building floors would become a secondary source. "Open pool" burning of kerosene produces temperatures approaching 1000 ^{o}C.

Alternatively, it would be possible to address the same conditions for a crash of a small aircraft fueled by aviation gasoline (Avgas). The difference with the Avgas (almost exclusively 100 Octane gasolines) is that it is even more ignitable than the jet fuel because of its physical and chemical properties. As noted on an Avgas Material Safety Data Sheet (MSDS) "this material is extremely flammable and can be ignited by heat, sparks, flames, or other sources of ignition" (Conoco Phillips, 23-May-2007). For example, Avgas has a much lower flash point, the lowest temperature at which a flammable vapor/air mixture exists at the surface above the fuel. The flashpoint for Avgas is <u>less than</u> -35 ^{o}F (-37 ^{o}C) while that of Jet A fuel is 100-150 ^{o}F (38-66 ^{o}C). While this crash wouldn't necessarily demolish the facility it would produce a fire. Flame temperature for gasoline (i.e., petrol) in an "open pool" fire (0.3 m diameter) is 1026 ^{o}C. (Drysdale, table 5.4, p. 165)

Fire or flames generate a great amount of heat at temperatures measured in the hundreds of degrees Celsius (^{o}C) (Drysdale, 1998). Heat is lethal to all microorganisms and each has its own particular heat tolerance. Microbiologists have long recognized that bacterial spores are the most resistant life form, and therefore it would be expected that spores would be the most heat tolerant. In fact, the effectiveness of sterilization (the killing of all life forms) is measured by the ability to kill bacterial spores. Each microbial species (and form, vegetative cell and spore) has a thermal death time, or the time necessary for killing it at a given temperature. Each species also has a thermal death point, or the temperature at which it dies in a given time. These parameters are experimentally determined and used by the food processing industry to evaluate the microbial inactivation of foods. As expected, spores require higher temperatures and longer time periods for inactivation (US FDA, 2002). As the temperature is increased the amount of time necessary to sterilize with dry heat is decreased. Whitney et al. (2003) showed, for example, that Bacillus anthracis spores were sterilized with a dry heat in >90 minutes at 140 ^{o}C, 10 minutes at 160 ^{o}C, 2 minutes at 180 ^{o}C, 1 minute at 190 ^{o}C, and 30 seconds at 200 ^{o}C. Higher temperatures would significantly reduce the sterilization time even farther.

Because of their heat resistanc, microorganisms like Coxiella burnetii burnetii that form spore-like protective structures are killed at higher than normal pasteurization temperatures (63 ^{o}C for 30 minutes, or 72 ^{o}C for 15 seconds) (FDA, 2007). Mycobacterium paratuberculosis also demonstrates this heat resistance (62 ^{o}C for 14 minutes, and 71 ^{o}C for 78 seconds). However, neither would survive as long as bacterial spores in dry heat.

In all cases, virtually the entire inventory of pathogens in the BSL-3 facility would be contained in 2-mL double-containment plastic vials maintained in padlocked freezer/refrigerators. The vast majority of pathogen material not in freezer/refrigerators would be in other types of double-

walled containment. This would include, for example, incubators and centrifuges. The only instances of single or non-containment would occur in the biosafety cabinets (BSCs) where potential aerosol releases would be captured by the BSC airflow and filtration system. Pathogen-inoculated animals would be held in quarantine cages in cage racks with HEPA filtration. Single or non-contained pathogen materials would be in liquid or solid (e.g., agar media) form and not dried or powdered. Temperatures of only a few hundred degrees Celsius for seconds or a few short minutes would be all that is necessary to destroy these microbial materials. The minimum temperatures of a fire following any aircraft crash into these buildings would exceed that and for a much longer time.

LLNL would not have large quantities of "milled" concentrated biological agents as suggested by commenters, and would not have any overly-specialized equipment for delivering biological materials. LLNL has no intention, and would be prohibited under Title 18 of the U.S.C, of developing or producing biological materials for weapons use, often referred to in the media as "weaponizing". LLNL would not use the process of "milling", which commenters imply is a technique used to "weaponize" a biological agent. Research will include creating small volumes of liquid slurries that would be introduced as aerosol droplets into the lungs of mice using a nebulizer, which is a bench-scale device used to create an aerosol spray. Except during very brief intervals of mouse exposure, aerosolized material would not be present in the facility. Since nebulizers are common pieces of lab equipment and are commercially available, there would be no specialized equipment present in the facility that would be attractive to a terrorist, particularly since other commercially available equipment could also be used to create a similar, inhalable fine mist. The biological materials in the slurry or in sample vials are collected from growth media in very small amounts and are not considered to be highly concentrated. Accordingly, biological materials and equipment in the BSL-3 facility would have none of the characteristics that commenters claim would make them more attractive to a terrorist than similar materials found in other, less secure locations or in nature.

NNSA acknowledges that spores of organisms such as anthrax can survive in soils for extended periods of time. In fact, anthrax spores occur naturally in soils such as those in the Livermore area and the surrounding Altamont hills. Spores are known to survive for decades, as one commenter suggests. However, the presence of naturally occurring anthrax spores in local soils has not resulted in adverse health impacts. This reinforces NNSA's conclusion that the few spores present in a sample that survive after an accidental release from the BSL-3 facility would not pose a significant human health risk.

As stated in the Revised EA, NNSA considers the probability of a successful terrorist attack at the LLNL BSL-3 facility to be minimized to an extent commensurate with the potential threat. However, the Revised EA does include a discussion of consequences of terrorist acts, however unlikely. NNSA acknowledges in the EA) that, as with the Anthrax Letters of 2001, serious consequences and perhaps fatalities could occur following covert theft of select agents, modification and subsequent release in a setting that would result in human exposures. Because the potential release scenarios are limitless, there is no rationale for evaluating any specific scenario. NNSA does not believe that other scenarios that cause a significant breach in containment would result in a release of biological agents that would pose adverse health effects or require modeling.

The commenters do not provide any information to support their assertion that an insider could covertly obtain large amounts of "ready-to-use" biological agents. The analysis in the EA assumes that only a small amount of material would be obtained covertly by an employee since the employee would not want the theft to be discovered. An employee with unrestricted access could remove larger quantities of material. However, stealing larger quantities would defeat the covert nature of the theft since large numbers of missing material would not go unnoticed. Also, samples are stored in -80 degree freezers in 2 ml vials, not large amounts of "ready-to-use", aerosolized pathogens, as suggested by commenters. For these reasons, the EA assumes that covert theft would involve very small quantities of material that would require additional growth and preparation before they could be dispersed.

NNSA acknowledges in the Revised EA that theft of a select agent by an insider is within the realm of possibility. For this reason, LLNL has instituted programs to ensure that insiders whose backgrounds suggest they are at risk for engaging in unreliable, untrustworthy, or disloyal behavior are not allowed access to select agents. As stated in the Revised EA, only personnel on LLNL's CDC registration are allowed to handle these agents. In addition, UC also requires that personnel having access to select agents and toxins must enroll in and be approved by the LLNL Select Agent Human Reliability Program as described in the Revised EA. NNSA believes the personnel security policies and practices implemented for work with pathogenic agents at LLNL adequately protects against the covert theft of biological materials by employees.

The foremost mission of the LLNL Protective Force is to deal with possible terrorism scenarios. The Protective Force has developed plans, procedures and training to counter scenarios identified in the Biological Risk and Threat Assessment (BRTA) and has conducted several emergency drills in the BSL-3 Facility with facility staff. Recent evaluations by NNSA have found that the biological select agent and toxin research program at LLNL effectively implements emergency management and security programs in a manner that is commensurate with the risk. This includes the performance of the Protective Force. Accordingly, NNSA believes the physical security of the BSL-3 Facility provides appropriate protection against terrorist acts. The details of the Protective Force tactics and training are not appropriate for discussion in a public document. Revealing the measures in place could negatively impact the effectiveness of their procedures by providing terrorist information to better plan attacks. Also, as noted above in the response to comments on the original EA, LLNL is prohibited by law from discussing the details of the structural features or other physical precautions that have been taken to mitigate potential concerns identified in the BRTA.

Routine procedures for work with biological agents in biosafety cabinets require the presence of bleach to disinfect equipment and surfaces at the completion of work. Spilled bleach spreading in the BSC would kill any spilled biological agents. Bleach is not stored in the -80 degree freezers and would not kill any materials spilled from those freezers in such an attack. However, biological material frozen at -80 degrees is not in a dispersible form.

Regarding storage of biological materials in freezers, NSSA is unaware of any scenario involving a freezer that would be worse than other scenarios already analyzed in the Draft EA. Material stored in vials in -80 degree freezers is very non-dispersible even in the event of a

breach of one of the freezers. The commenter did not provide any additional information about how an accident involving a freezer would be any different or worse than other postulated accidents.

In regards to the comment comparing the LLNL BSL-3 and the Diablo Canyon Nuclear Plant, there are marked difference between the two situations that, in NNSA's opinion, render them distinct and different cases. Security is at a high level at all commercial nuclear plants in the United States. There is virtually no difference between the security at Diablo Canyon and any of the other 100 plus nuclear plants currently in operation. Security at the over 1300+ BSL-3 facilities in the United States, on the other hand, can vary widely between institutions. Since the BSL-3 Facility at Livermore is one of the most highly secure facilities anywhere in the world, NNSA believes the likelihood of direct attack is low. Also fuel in a form suitable for nuclear reactors is not found in nature as are the organisms to be studied in the BSL-3 facility. As such, there are a wide variety of potential natural sources for pathogens, as opposed to the very small number of sources for nuclear materials.

Commenters expressed the opinion that releases from the BSL-3 facility following catastrophic loss of containment cannot be compared to releases commonly observed during births in domestic herds of sheep, cattle and goats. NNSA believes that this comparison actually overstates the potential risk. NNSA directs commenters to a representative study published in the CDC "Emerging Infectious Diseases" publication titled "Wind in November, Q fever in December" (CDC, 2004). This study demonstrates human exposure from naturally occurring sources, in particular, Q fever transmission from animal reservoirs to humans by the inhalation of infected aerosols created during lambing season. C. burnetii does not form spores, but does form a spore-like small cell variant (SCV). Regions containing farms where outdoor birthing is common are considered a "potent source" of the C. burnetii SCV, according to this study, and windborne generation of aerosols is higher during the dry season. Persons living downwind from an extensive sheep-rearing area were shown to have an incidence of Q fever 5.4 times higher than that of a near-by urban area (CDC, 2004). Seventy three (73) cases of acute Q fever were diagnosed in a three-year period in this study area (however, even during this large outbreak, there were no fatalities) . As the EA notes, this is because concentrations of C burnetii organisms occur in birth fluids up to 10^{12}/g and birth products are left on the ground where they form a source of aerosols. By comparison, concentrations of organisms in samples in the BSL-3 Facility would normally be 10^{8}/ml and would not exceed 10^{10}/ml. Also, the samples would be in a frozen, non-dispersible form. As this example demonstrates, impacts of a release from the BSL-3 Facility following a catastrophic breach of containment would be less than those observed to occur downwind from areas with domestic livestock herds or other areas where these organisms occur naturally.

Reference: CDC 2004
"Wind in November, Q fever in December"
Hervé Tissot-Dupont, Marie-Antoinette Amadei,† Meyer Nezri,† and Didier Raoult**
Emerging Infectious Diseases
Vol 10, No. 7, July 2004
National Center for Infectious Diseases
Centers for DiseaseControl and Prevention

1600 Clifton Road, Mailstop D61,
Atlanta, GA 30333, USA.
http://www.cdc.gov/ncidod/eid/vol10no7/pdfs/Vol10No7.pdf

As noted on page 19, "Before any infectious microorganisms would be handled in the BSL-3 laboratories, the IBC and the researcher, in accordance with CDC guidance, would perform a risk analysis. LLNL occupational medicine and the local medical community would be informed of the microorganisms to be handled in the BSL-3 laboratories and would be aware of the methods of identification and control of associated diseases." This risk assessment and it's associated medical community awareness component is considered adequately protective by CDC prior to conduct of work with genetically modified materials.

LLNL implements security measures at LLNL for all programs, including the Superblock, commensurate with the threat. However, plutonium and highly enriched uranium are also managed by NNSA at multiple other sites in the NNSA weapons complex. Due to cost of security, NNSA has decided to consolidate these materials in fewer locations. This a cost-based decision that does not imply there is a level of security risk at LLNL that would warrant removal of biological materials.

Many commenters imply that co-location of biological research and nuclear research on the same site increases the likelihood that a terrorist act would occur because of the potential for a terrorist to obtain both nuclear and biological materials. Commenters do not suggest a scenario in which a terrorist would either try to destroy or breach both nuclear and biological facilities at the same time, or obtain both nuclear and biological materials. As stated in the revised Revised EA, NNSA considers the probability of either a direct attack on the BSL-3 Facility or a theft of biological materials to be very low. This assessment takes into consideration the co-location of the BSL-3 Facility with numerous other research facilities, including nuclear facilities.

8. TRANSPORTATION SAFETY

One commenter expressed concern about the safety of biological material shipments, especially traveling through the USPS, to and from the facility. The commenter stated that the EA does not adequately analyze the possibility of a shipment of pathogens being intercepted.

Comments on the Revised Draft EA received during the public comment period did not express any new concerns or provide information that was new and pertinent to transportation safety. However, DOE received additional comments after the public comment period regarding the shipping incident discussed in Section 4.2.2.3 of the EA, "Transportation Accident". In response, additional information about this incident was provided in Section 4.2.2.3.

Response
The volume of shipments of microorganisms into the proposed BSL-3 facility would increase when the facility first begins its operation, then would taper off to levels that are only marginally higher than are experienced today in support of existing and ongoing LLNL bioscience and health technology research. Shipments out of the facility would also represent only a slight increase over existing levels of biological shipments. Both incoming and outgoing shipments are

typically of milliliter- or micro liter-size samples packaged inside several layers of containment, per Department of Transportation (DOT) shipping requirements. The packaged samples are shipped via federal and commercial or private couriers and are tracked in accordance with nationally-accepted DOT and CDC requirements. Any increase in incidence of shipping accidents due to the incremental increase in the number of shipments to and from LLNL as a result of implementing the proposed BSL-3 facility would be negligible given the volume of mail and packages transported by these transport services. Similarly, any increase in vulnerability of biological agent shipments to terrorist seizure resulting from the incremental increase in shipments to or from LLNL would be negligible given the volume of mail and packages transported by these national-scale operations.

The EA notes that the shipment of samples to and from LLNL would involve materials packaged in accordance with DOT standards. The packaging required by DOT has already undergone extensive drop, crush, and other accident-condition testing, before DOT determined the safe and appropriate transport and packaging requirements for these types of samples. Using DOT standards for packaging and/or using couriers that transport the shipments according to DOT requirements does not result in an obligation by DOE to perform a unique NEPA review for transport of its materials through common carriers. Transportation of microbiological samples to and from various points around the country and around the world, when performed according to DOT standards for packaging and shipment, should result in no human health or environmental effects to the carriers themselves or to the public along the routes. Federal and commercial carriers have been transporting appropriately packaged biological samples for many years both before, during, and after the recent anthrax-contaminated letters were mailed. Hospitals, laboratories, schools, universities, and teaching facilities engage in the transport of biological samples in large numbers every day. Any increase in the risk of accident or terrorist attack because of shipments associated with the proposed BSL-3 facility at LLNL would be negligible.

9. PURPOSE AND NEED

A commenter expressed the opinion that the proposed action is not sufficiently justified in the "purpose and need" secton of the Draft EA. The commenter suggested that the DOE should look comprehensively at existing BSL-3 facilities and capabilities, so as not to duplicate capabilities by constructing a BSL-3 facility at LLNL. For example, the commenter questioned why the Draft EA did not discuss in more detail the option to conduct all the necessary BSL-3-level work at a BSL-3 facility currently used by LLNL (such as the CDC facility in Fort Collins) for its current projects. Additionally, commenters were of the opinion that the DOE is required to analyze whether the proposed Los Alamos National Laboratory (LANL) BSL-3 facility would provide an alternative to construction of the proposed facility at LLNL. Commenters questioned why it is necessary to have two BSL-3 facilities under the jurisdiction of the DOE, when BSL-3-level research could be done at one facility.

Comments on the Revised Draft EA did not express any new concerns or provide information that was new and pertinent to the purpose and need for the EA.

Response
LLNL conducts its own specific research, including understanding genetic and biochemical causes of disease, projects for countering biological terrorism, bioengineering research, and developing and applying computational biology capabilities. Many of these are unique to LLNL. Currently, DOE and NNSA research projects requiring BSL-3 sample preparation are contracted to universities or private sector laboratories. This procedure has increasingly become difficult and represents a barrier to continued efficient research for several reasons. Government and private sector projects requiring BSL-3-level facilities are on the rise, resulting in the existing laboratories being unable to accept as much outside work such as that represented by NNSA's/DOE's projects. Information security also needs to be carefully considered, since information associated with some samples requires a very high degree of physical security, which is not uniformly available through the use of contractor facilities. Additionally, scheduling difficulties at contract laboratories could seriously limit or compromise timely research projects. Quality assurance documentation, including chain of custody issues related to federal projects, are also essential to verifying data and interpreting results. It is critical to the research being conducted that the quality and security of samples not be compromised. If the DOE hopes to further the Nation's ability to detect and isolate microorganisms and treat victims of bioterrorism, enhanced capabilities are necessary at the location-centers for such research. For the reasons described above, the integrity of the research dictates that the BSL-3 facilities be under the direction of DOE, and the individual National Laboratory. It is not possible to continue conduct of all the BSL-3-level research in a timely, efficient, cost-effective, or security-controlled manner at another laboratory.

Although construction of the LANL BSL-3 facility recently began, it is not operational and won't be until it has met all readiness requirements. In addition, the research currently conducted at LLNL is different from that at LANL, and it is likely that each facility will continue to have separate areas of expertise. LLNL and LANL staff members would continue to collaborate on technical matters relating to their separate research and development efforts, as they have been doing in the past. For these reasons, DOE and NNSA believe that it is not duplicative to have two BSL-3 facilities under the jurisdiction of the DOE.

10. ADEQUACY OF ALTERNATIVES ANALYSIS

A commenter expressed the opinion that the discussion of alternatives in the Draft EA is deficient, stressing that a careful analysis of alternatives is essential due to the risks of placing such a laboratory in a densely populated urban area. According to the commenter, the EA addresses only various ways to construct a BSL-3 facility at LLNL but does not compare other possibilities for accomplishing the mission, such as using other existing facilities, using government facilities to be constructed in the near future, or constructing a BSL-3 facility at another DOE site.

One commenter claimed that the EA did not evaluate the consequences of the "No-action" alternative with respect to terrorist acts.

Response
The Draft EA presents a discussion of three different alternatives for construction and operation of a BSL-3 Facility at another National Security Laboratory or at the other locations at the Livermore Site or at Site 300 (Sections 2.5 through 2.5.3). The discussion of these alternative indicates that they do not meet the NNSA's purpose and need. Accordingly, these alternatives were not analyzed further in the EA.

The response to topic 5 above reviews the accident scenario and potential for risk to the local community. The response to topic 9 above addresses the need for a BSL-3 facility under the jurisdiction of DOE at LLNL, and discusses why the use of existing facilities located off-site (including potential BSL-3 facilities at other DOE sites) does not meet this need.

The Revised Draft EA did consider the impacts associated with a terrorist act under the "No-action" alternative. As noted on pages 63 and 64 of the Revised Draft EA, terrorist acts are possible under the No-action alternative, as evidenced by the 2001 Anthrax Letters. In NNSA's opinion, the proposed action does not measurably add to the avenues already available to a terrorist for obtaining pathogenic materials or measurably increase the likelihood of this type of malicious act. As stated on page 63, "Because a malicious individual could already obtain pathogenic material by other methods under the No-Action ("status quo") Alternative, the presence of pathogenic agents in the proposed, highly secured BSL-3 facility would not pose any new or greater risk to human health or the environment from an outside terrorist or terrorists than already accrues without operation of the BSL-3 facility at LLNL"

11. WASTE DISPOSAL

Commenters stated that although the Draft EA indicates that the proposed facility would direct 10,000 gallons of wastewater to the city sewage system, the EA does not adequately describe a monitoring system for the wastewater. Commenters questioned how LLNL would detect a "release" and how it would be prevented from being released into the city sewage treatment. The commenters expressed the opinion that since LLNL has had releases of toxic metals, radionuclides, and hazardous materials, a more thorough analysis of these issues should be undertaken.

One commenter remarked that the Draft EA was not clear on whether liquid waste materials generated from laboratory operations would be discharged directly to the sanitary sewer or first to retention tanks. The commenter points out that page 34 in the Draft EA states that liquid waste from the proposed facility operations would be discharged to a retention tank system, but page 45 states that there would be no retention tanks. The commenter also noted that discharge of waste from improperly characterized retention tanks to the sewer system has been a problem in the past at LLNL with radioactive and hazardous wastes, and suggested that discharge of toxins or pathogens to the sewer system is a possibility.

Similar comments were also raised concerning solid waste disposal. Commenters raised concerns about which area landfills would be used for non-hazardous solid waste and what analytical methods LLNL would employ to ensure that hazardous and infectious agents are not sent to the landfills.

Comments on the Revised Draft EA did not express any new concerns or provide information that was new and pertinent to waste disposal.

Response

As described in the LLNL Environmental Report 2000 (LLNL 2001b) made widely available to the public, LLNL achieved greater than 99% compliance with Livermore Water Reclamation Plant (LWRP) permit limits covering discharges into the sanitary sewer during 2000. During 2000, only three notices of violation were written (two for metals and one for cyanide) and no sewer releases exceeded discharge limits for radioactive materials. LLNL achieved between 99 percent and 100 percent compliance with permit discharge limits for 1996 through 2000.

All LLNL medical waste management operations comply with the California Medical Waste Management Act, which establishes a comprehensive program for regulating the management, transport, and treatment of medical wastes that contain substances that may potentially infect humans. In September 2000, an Alameda County Department of Environmental Health (ACDEH) inspection of the Biology and Biotechnology Research Program (BBRP) found no compliance issues or violations (LLNL 2001b). The Annual LLNL Environmental Reports for 1997-1999 state that inspections of LLNL's medical waste generator and treatment facilities also resulted in no compliance issues or violations. In 1996 the Alameda County Environmental Health Services Inspector issued only one report of violation for storage of medical waste (cotton swabs, bandages, and gauze pads) longer than 7days above 0^{o} C. Immediately after the violation was received, a LLNL self-assessment of medical waste compliance was conducted, additional training was provided, and revised medical-waste management procedures were implemented.

Sanitary liquid waste would be generated from the proposed BSL-3 facility from research activities and from toilets, showers, and sinks. Soluble or liquid waste material generated from laboratory operations are expected to be about 3 gallons per week and would be treated with disinfectants prior to disposal in the laboratory sinks. As stated in the EA, no discharge limits currently exist for infectious materials that are commonly discharged by healthcare and veterinary facilities and laboratories or homes. However, liquid waste generated from the proposed BSL-3 operations would be discharged to a retention tank system for characterization and disinfection as needed prior to discharge to the sanitary sewer system. The incorrect statement on page 45 (no retention tanks) of the Draft EA has been removed. Discharge guidelines, monitoring, and applicable regulatory requirements and restrictions are described in Section 3.3.5 of the EA.

As described in Section 2.1.2 of the EA, all waste generated in the laboratories of the BSL-3 facility (including sample packaging, culture materials, petri dishes, personal protective equipment, and associated process wastes) would leave the laboratories only after decontamination in the autoclave and/or after being chemically sterilized. Waste sterilization

and quality assurance procedures for the autoclave are detailed in the EA. Live pathogen agents are not sent to landfills. No toxic metals, hazardous wastes, radiological waste, or hazardous chemical waste would be generated by the facility. Solid waste generated from the proposed facility would be sent to area landfills in the same manner as other BBRP and LLNL-produced solid waste. Any biological shipments sent from LLNL to other researchers or the CDC are decontaminated prior to shipment, as described in the EA.

12. TIMELINE FOR THE BSL-3 FACILITY

Commenters expressed the opinion that the timeline for construction of the LLNL BSL-3 facility, stated in the Draft EA as "…estimated to start in FY 2002 and take approximately 6 months to complete", indicates that the DOE is not serious about a good-faith NEPA review nor public involvement in decision-making. The commenter states that the 6-month construction period suggests that DOE has already decided to use a prefabricated building and the construction timeframe indicates a foregone conclusion and not a decision that is dependant on the NEPA review process.

Comments on the Revised Draft EA did not express any new concerns or provide information that was new and pertinent to the timeline for the BSL-3 facility.

Response
The proposed action in the Draft EA (a permanent modular unit constructed off-site and assembled on-site) is clearly described as the preferred alternative. CEQ and DOE NEPA regulations call for an EA to describe the Agency's preferred alternative, but this does not suggest that DOE has chosen this alternative, begun implementation of the alternative, or in any other way predetermined the results of the NEPA review process. The same is true for the projected construction schedule noted in the proposed action in the Draft EA. The dates and completion schedule outlined in the Draft EA were proposed schedules for the preferred alternative provided for illustrative purposes for the preferred alternative. Revised projected schedules for project completion are included in the Final EA.

13. OVERSIGHT

Commenter's expressed concern that NNSA does not provide adequate oversight for BSL-3 activities. Commenter's provided quotes from what they claim is the July 2005 IG Report 0695, including: "We concluded that there was insufficient organization, coordination, and direction in the Department's biological select agent activities. Specifically, the Department's activities lacked sufficient Federal oversight, consistent policy, and standardized implementing procedures, resulting in the potential for greater risk to workers and possibly others from exposure to biological select agents and select agent material maintained by the Department." Commenters request that NNSA describe how this report has been responded to and what is happening now regarding NNSA's efforts to coordinate select agent programs.

Response
The quotes are from the February 2001 IG report "Inspection of Department of Energy Activities Involving Biological Select Agents", and not from the July, 2005 IG Report 0695 as cited by the commenter. The July 2005 IG report included only 2 recommendations:

1. *An enduring entity should be created and empowered to coordinate biological select agent activities and issues across the DOE complex; and,*

2. *The Department should develop a corporate strategy for the establishment of biosafety level laboratories, to include determining the number and location of BSL-3 facilities, coordinating future construction funding, ensuring that work is not duplicated, and addressing associated safety and security issues.*

The DOE has concurred with both of these recommendations. As a fist step, a Biosurity Executive Team has been established. The charter of this Team is to recommend the establishment of biosurety-related policies, regulations, requirements, and standards. To address the second recommendation, the NNSA and the Office of Science have both committed to developing a corporate strategy for the establishment of biosafety level laboratories. However, it is beyond the scope of this document to review the potential impacts of a nationwide DOE Program.

14. PUBLIC COMMENT PERIOD AND PUBLIC HEARINGS

Commenters expressed their concern that DOE/NNSA has not given the public adequate time or opportunity to respond to the revised EA and requested the public comment period be extended for at least 45 additional days. In addition, commenters requested that DOE/NNSA hold public comment hearings in the impacted communities during the extended public comment period. Commenters claim that most area residents and other interested members of the public were not aware of the public comment period and that it was not widely publicized by the NNSA or LLNL.

Response
The DOE believes the extent of public participation opportunities for the Draft Revised Final EA has been appropriate and consistent with Federal regulations and DOE Policy.

The revised document was made available for a 30 day comment period beginning April 11 and ending May 11, 2007. The document was made available for review at the public libraries in Livermore and Tracy, at the public reading room at the LLNL site, and on the web at www-envirinfo.llnl.gov. A press release was issued announcing the availability of the document at the start of the comment period. This resulted in the information being communicated to the public through a variety of media. For example, the San Francisco Chronicle published an article on April 12, 2007 discussing the draft document. This article was made available on line and included links to the document. The Tracy Press published an article on April 13, 2007 and included the story on its website with a link to the document. The Tri-Valley Herald also published an article on April 12, 2007, and the Livermore Independent on April 19, 2007. A

local Television station, KTVU, reported on the availability of the document. In addition, the availability of the document was announced on the websites of several local public interest groups.

No comments received were excluded from the record. All comments were accepted even if they were received after the 30 day period.

This is the second opportunity for the public to comment on the substance of the document. The draft document was a revision of a previous document which had been publicly available for over 4 years. The revised document included only approximately 13 pages of new or revised text as compared to the previous version.

The DOE/NNSA believes the comment period was very successful. Over 80 comment responses were received from residents of 8 different states and the District of Columbia.

C.2 Public Comment Letters/Email Messages Received on Revised EA

Table C-2 lists all the public comments received for this Revised EA. Many were form-type email and letter submissions (identified by an asterisk in the first column on the table). Following the table are the letters and emails submitted. Only one of the form-type emails is shown. Comments previously received on the original 2002 EA have been left out to reduce the length of this appendix.

TABLE C-2. LIST OF PUBLIC COMMENT LETTERS/EMAIL MESSAGES RECEIVED ON THE REVISED EA

Email/ Letter	Name	E-mail Address	Address
Email	John Ahlquist	john.ahlquist@sbcglobal.net	1625 Geary Road, Walnut Creek, CA 94597
Email*	David Anderson	davea@ssl.berkeley.edu	1627 Blake Street, Berkeley, CA 94703
Email*	Rebecca Barker	wecandoit@planet-save.com	24559 Alessandro Blvd., Moreno Valley, CA 92553
Email*	Maya Be	mayabels@hotmail.com	545 SW 155th Street, Burien, WA 98166
Email*	Marilyn Becker	becker3049@yahoo.com	Oakland, CA 94602
Email*	Thad Binkley		4132 Cristobal Way, Pleasanton, CA 94566
Email*	Jeffrey Birnbaum	jeffb@sopris.net	44 Sibley Road, Santa Fe, NM
Email*	Meg Carter	sea_of_galilee@sbcglobal.net	Oakland, CA 94610
Email*	Urs Cipolat	cipolat@yahoo.com	Oakland, CA 94611
Email	Jay Coghlan, Scott Kovac & John Witham, Nuclear Watch of NM	john@nukewatch.org	551 West Cordova Road #808, Santa Fe, NM 87505
Email	Chelsea Collonge, Nevada Desert Experience	chelseavc@gmail.com	
Email	Robert R. Curry		436 14th Street, Suite 1300, Oakland, CA 94612
Email	Mary Davis, PhD., Yggdasil, a project of Earth Island Institute	yggdrasili@yahoo.com	P.O. Box 910476, Lexington, KY 40591-0476
Email*	Debi De Respini	dderespini@flexoprint.com	Tracy, CA
Email	Martha Dragovich	mp4ever@mac.com	
Email*	Stephanie Ericson	sericson@sbcglobal.net	8301 Mulberry Place, Dublin, CA 94568
Email	Arpad Fekete	arpadfekete@hotmail.com	777 Polaris Way, Livermore, CA 94550
Email*	Arpad Fekete		777 Polaris Way, Livermore, CA 94550
Email*	Vivian Fekete		777 Polaris Way, Livermore, CA 94550
Email*	Craig Fiels	cofiels@santafenm.gov	110½ Barcelona Street, Santa Fe, NM 87504
Email*	Michael Flynn	rmflynn79@gmail.com	2263 Park Blvd, Apt A, Oakland, CA 94606
Letter*	JoAnn Frisch		852 Sungold Circle, Livermore, CA 94551
Letter*	Sue Gibbons		928 Hough Avenue, Lafayette, CA 94549
Email	Robert M. Gould, Physicians for Social Responsibility	rmgould1@yahoo.com	311 Douglass Street, San Francisco, CA 94114
Email	Janet Greenwald, Citizens for Alternatives to Radioactive Dumping	contactus@cardnm.org	202 Harvard SE, Albuquerque, NM 87106
Email*	Karen Hadden, Peace Action Texas	karen@seedcoalition.org	1801 Westlake Drive #209, Austin, TX 78746
Email	Edward Hammond, The Sunshine Project		P.O. Box 41987, Austin, TX 78704
Email*	Barry Hatfield	barryhat@cybermesa.com	929 Placito Chaco, Santa Fe, NM 97505
Email	George & Louise Heath	LHeath5445@aol.com	5445 Kathy Way, Livermore, CA 94550
Email*	George & Louise Heath	LHeath5445@aol.com	5445 Kathy Way, Livermore, CA 94550
Email*	Karen Heikkala	kheikkala@sbcglobal.net	502 Arbor Lane, Austin, TX 78745
Email*	Marcia & Ricardo Hofer	hofermr@sbcglobal.net	Oakland, CA 94618
Email*	Phyllis Jardine		4132 Cristobal Way, Pleasanton, CA 94550
Email*	Stephan S. Kelly		484 Lake Park Avenue #458, Oakland, CA 94610
Email	Marylia Kelley & Loulena Miles, Tri-Valley CAREs	loulena@trivallycares.org	2582 Old First Street, Livermore, CA 94551
Email	Daniel Kendrick	daniel@nowwatchthis.com	4274 Fairlands Drive, Pleasanton, CA 94588
Letter	Beverly King		645 N. Livermore Street, #8, Livermore, CA 94551

TABLE C-2. LIST OF PUBLIC COMMENT LETTERS/EMAIL MESSAGES RECEIVED ON THE REVISED EA

Email/ Letter	Name	E-mail Address	Address
Email*	Beverly King		645 N. Livermore Street, #8, Livermore, CA 94551
Email*	Grace Laland		1611 Cove Camp Road, Williams, OR 97544
Email*	Matthew Liebman, Esq.	mliebman@stanfordalumni.org	301 W. 2nd Street #416, Santa Ana, CA 92701
Email*	Marvin Lewis	marvlewis@juno.com	3133 Fairfield Street, Philadelphia, PA 19136
Letter*	Kris Lindsey		9285 Miners Crossing, Loomis, CA 95650
Email	Nicole Lucchesi	nikki@soundwavestudios.com	
Email*	Rita Maran	ritam@calmail.berkeley.edu	1326 Shattuck Avenue, Berkeley, CA 94709
Email	Kalliroi Matsakis, Concerned Citizens for Nuclear Safety	kmatsakis@nuclearactive.org	107 Cienega Street, Santa Fe, NM 87501
Email	Matthew McKinzie, PhD., Natural Resources Defense Council	mmcKinzie@nrdc.org	1200 New York Ave., N.W., Suite 400, Washington, DC
Email	Penelope McMullen, SL, Loretto Community	pmsl@cybermesa.com	113 Camino Santiago, Santa Fe, NM 87501
Email*	Betty Miles		1316 St. Mary Drive, Livermore, CA 94550
Email*	Del Miles		1316 St. Mary Drive, Livermore, CA 94550
Email	Loulena Miles & Marylia Kelley, Tri-Valley CAREs	loulena@trivallycares.org	2582 Old First Street, Livermore, CA 94551
Email	Yvonne Miles	RedMiles@aol.com	2715 Almondridge Drive, Antioch, CA 94509
Email*	Virginia J. Miller	vjmopus@cybermesa.com	125 Calle Don Jose, Santa Fe, NM 87501
Email*	Patricia Ann Moore, MSW	tmyoga@jps.net	23 Diamond Drive, Livermore, CA 94550
Email*	Rebecca Mullaney	bubbleylove@hotmail.com	San Rafael, CA 94901
Email*	Nicole Nicodemus	atema@sbcglobal.net	1926 Woolsey Street, Berkeley, CA 94703
Email*	Cathe Norman		7986 Driftwood Way, Pleasanton, CA 94588
Email*	Frederick R. Norman		7986 Driftwood Way, Pleasanton, CA 94588
Email*	Carleigh O'Donnell	cmo@umail.ucsb.edu	6641 Abrego Road, Goleta, CA 93117
Email*	Tatiana Perez	etatianaperez@yahoo.com	2453 34th Avenue, Apt #4, Oakland, CA 94601
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Email	Martha Priebat	mammadoc@earthlink.net	
Email*	Carolina Purvis	carolinap@sbcglobal.net	Danville, CA
Email	Megan R. Radmore	megan_renee79@yahoo.com	
Email*	Kai Sawyer	lorax.kai@gmail.com	606 Cayuga, Santa Cruz, CA 95062
Email*	Joseph Schoorl	toygunsthatspark@gmail.com	
Email*	Eric Schultz	ericrobertschultz@gmail.com	San Francisco, CA 94123
Email*	Marna Schwartz	marnaschwartz@yahoo.com	2338 Roosevelt Avenue, Berkeley, CA 94703
Email	Ann Seitz	ann@trivalleycares.org	22103 Main Street, Hayward, CA 94541
Email	Virginia Sharkey	v.sharkey@sbcglobal.net	157B North Star Drive, Santa Rosa, CA 95407
Email	Jacob Smith	Jacob.meacham.smith@gmail.com	14 Allen Street, Amherst, MA 01002
Email*	Shannyn Sollitt	networks@networkearth.org	P.O. Box 9509, Santa Fe, NM 87504
Email*	Ramsey Sprague	rsprague@tarrantgreens.org	7114 Forestview Drive, Arlington, TX 76016
Email*	Steve Steckler	SSteckler@aol.com	Silver Spring, MD
Email	Peter M. Strauss, PM Strauss & Associates	petestrauss1@comcast.net	
Email	Janis Turner	jkturner2001@yahoo.com	749 Hazel Street, Livermore, CA 94550
Email*	David Ulansey, PhD.	davidu@well.com	2214 Durant Avenue #3, Berkeley, CA 94704
Email	Elizabeth West	ewest@cybermesa.com	
Email	Stephan C. Volker, Tri-Valley CAREs	svolker@volkerlaw.com	436 14th Street, Suite 1300, Oakland, CA 94612
Email	Dr. Mark Wheelis, Section of Microbiology/CBS	mlwheelis@ucdavis.edu	University of California, 1 Shields Avenue, Davis, CA 95616
Email*	Vicki Wolf	vicki@vickiwolf.com	2408 Riverside Farms Road, Austin, TX 78741
Email*	Walter I. Zeichner	walter@walterzeichner.com	P.O. Box 327, Cazadero, CA 95421

* Form-type letter or email

1625 Geary Road
Walnut Creek, CA 94597
April 20, 2007

Mr. Samuel Brinker
NEPA Document Manager
US Department of Energy
Livermore Site Office
M/S L-293
PO Box 808
Livermore, CA 94551

Dear Mr. Brinker:

In response to the April 11, 2007 call for public comments on the Environmental Assessment for the Biosafety Level 3 [BSL-3] Facility at the Livermore National Laboratory [LLNL], I have the following comments.

For background:

1. BSL-3 facilities are found throughout the nation at medical centers, universities, bio-tech companies, and government and research institutions. I know of 40 such laboratories in California and suspect there are many more. BSL-3 level facilities are found in many other places in the world. I just read of security concerns at 30 such facilities in Denmark.
2. In the United States there are 335 laboratories registered to handle "select agents" by the Centers for Disease Control with 245 of them being authorized to use live anthrax.
3. The LLNL BSL-3 laboratory has passed the rigorous certification process by the independent certification contractor World BioHazTec. In addition it has undergone numerous reviews by the University of California and the National Nuclear Security Administration [NNSA]. I suspect it is one of the best evaluated BSL-3 laboratories in the nation.
4. I suspect security at the LLNL BSL-3 facility is among the best in the nation. For example, I doubt that many BSL-3 facilities require badge checks to get on site with armed guards wearing Kevlar vests manning the guard posts. I doubt than many BSL-3 facilities could have an armed response from such security guards within several minutes of an alarm. Certainly you wouldn't have this kind of response at a university or medical center or even likely a bio-tech facility. It is likely that the background security checks are much more rigorous at LLNL than any of the other aforementioned institutions.

It is unfortunate that this facility is not already open. In the universe of BSL-3 laboratories it is one of the safest and most secure. The lawsuits that have impeded its progress were prompted by those who tend to oppose any defense activities at LLNL through the tactic of alarming the

public through misinformation. The terms of all lawsuits have been satisfied and it's time to move on.

The original Finding of No Significant Impact [FONSI] was correct. I urge you to promptly issue the updated FONSI and rapidly authorize operations in the LLNL BSL-3 facility so that bio-defense research can start and hopefully lead to better national biosecurity. I challenge the NNSA to have the necessary reviews and documentation completed in time so that the facility can start operations by June 1, 2007.

Thank you for this opportunity to comment.

Sincerely,

A. John Ahlquist

A. John Ahlquist

-----Original Message-----
From: David Anderson [mailto:davea@ssl.berkeley.edu]
Sent: Wednesday, May 09, 2007 12:46 PM
To: Brinker, Samuel
Subject: Opposition to proposed facility

To whom it may concern:

The community doesn't want your bio-warfare-lab! Here is what we want:

* The Department of Energy (DOE) should hold a public hearing so that the public can learn more about this plan and provide oral comments. So far, the number of public hearings that DOE has held on this important issue is ZERO.

* The 30-day written comment period (which ends May 11, 2007) is too short. Most area residents and other interested members of the public don't know about the comment period. It has not been widely publicized by the Department of Energy or Livermore Lab. Therefore, people are being deprived of their right to comment.

* The written comment deadline should be extended for a minimum of one additional month (to June 11). And, a public hearing (see above) should occur within the extended public comment deadline.

We oppose a bio-warfare research facility at the Livermore Lab main site because:

* Advanced biodefense research (i.e., with bio-warfare agents like live anthrax and plague) should not be collocated with nuclear weapons research. If the U.S.
mixes "bugs and bombs," it could complicate enforcement of the Biological Weapons Convention, the international treaty banning bio-weapons.

* Livermore Lab sits within a 50-mile radius of seven million people. This highly populated area is not an appropriate place to conduct experiments with some of the deadliest agents known.

* Livermore Lab is located near active earthquake fault lines. The BSL-3 is a portable building that was brought to Livermore Lab on a truck. This BSL-3 should not be operated in a seismically active area. The revised Environmental Assessment states that new research by the USGS has determined there is a 62% chance that one or more magnitude 6.7 earthquakes will occur in the area within the next 30 years. Other studies predict a quake with MM 10 shaking in the Livermore area (which

is very violent - the scale is 1 to 10). The revised EA briefly mentions these key facts, but does not fully account for them in conducting its hazard analysis.

* The revised Environmental Assessment does not do an adequate job of analyzing potential terrorist threats. For example, it too optimistically assumes that most bio-agents would be destroyed in a terrorist attack, and therefore not many would escape into the environment and pose a hazard to workers and the community.

* The revised Environmental Assessment does not analyze the environmental and health impacts of a release of the BSL-3's total inventory of up to 100 liters of bio-warfare agents. In fact, the revised EA fails to even disclose that other Livermore Lab and Department of Energy documents state the BSL-3 facility will house up 25,000 different samples of pathogens adding up to a total of 100 liters of bioagents at a time. Therefore, the hazard level posed by the Livermore Lab BSL-3 is far, far greater than the revised EA considers.

* The revised Environmental Assessment suggests that a potential terrorist would rather try to find dangerous pathogens in nature than attempt to steal them in larger, more concentrated quantities from the Livermore Lab BSL-3. That assumption is absurd.

-- David Anderson
1627 Blake St.
Berkeley, CA 94703

nuclear watch new mexico

May 11, 2007

Samuel Brinker
National Environmental Policy Act Document Manager
U.S. Department of Energy
National Nuclear Security Administration,
Livermore Site Office
M/S L-293
P.O. Box 808
Livermore, CA 94551-0808
samuel.brinker@oak.doe.gov
Fax: (925) 423-5650.

Dear Mr. Brinker,

Nuclear Watch New Mexico (NukeWatch) submits the following comments on the Draft Revised Environmental Assessment (EA) for The Proposed Biological Safety Level (BSL)-3 Laboratory at Lawrence Livermore National Laboratory (LLNL) (DOE/EA-1442R). Our Comments are in three parts: 1) General comments on the revised EA; 2) Specific comments on the revised EA; and 3) Our comments on the original draft dated September 7, 2002. We include our original comments in this revised EA because NNSA failed to include them in the legal record for the original EA, despite the fact that the NNSA Document Manager for the LLNL BSL-3 EA acknowledged receipt of our comments.

General Comments

This revised EA is a result of two Ninth Circuit Court decisions. In its October 16, 2006 decision on Tri-Valley CARES v. Department of Energy, to which Nuclear Watch is co-plaintiff, the Court ruled "Concerning the DOE's conclusion that consideration of the effects of a terrorist attack is not required in its Environmental Assessment, we recently held to the contrary in San Luis Obispo Mothers for Peace v. Nuclear Regulatory Commission, 449 F.3d 101 6 (9th Cir. 2006). In Mothers for Peace, we held that an Environmental Assessment that does not consider the possibility of a terrorist attack is inadequate. Id. At 1035. Similarly here, we remand for the DOE to consider whether the threat of terrorist activity necessitates the preparation of an Environmental Impact Statement."

Subsequently, DOE issued Department-wide guidance on December 1, 2006 entitled "Need to Consider Intentional Destructive Acts in NEPA Documents." We note first that DOE should do the right thing and issue final guidance (the final BSL-3 EA should state when), especially given the many NEPA processes, from nation-wide programmatic environmental impact statements to site-specific environmental assessments, that are now currently scheduled. In any event, the interim guidance states that, "DOE National Environmental Policy Act (NEPA) documents, including environmental impact statements (EISs) and environmental assessments (EAs),

551 West Cordova Road #808 Santa Fe, New Mexico 87505 Vox and Fax 505.989.7342
info@nukewatch.org www.nukewatch.org

should explicitly address potential environmental consequences of intentional destructive acts (i.e., acts of sabotage or terrorism)."

This revised Environmental Assessment, which is DOE's first NEPA document that responds to the Ninth Circuit Order and new DOE guidance, does a miserable job of analyzing intentional destructive acts. This does not bode well for all future DOE NEPA processes. We respectfully suggest that DOE could possibly save itself considerable trouble in the future by correcting the deficiencies in this revised EA so that it can be a useful model for future analyses of Intentional Destructive Acts in all future DOE NEPA processes.

This revised EA spends too much time analyzing the possibility and probability of intentional destructive acts and dismissing them and not enough time addressing the potentially all too real environmental consequences of intentional destructive acts. When the environmental consequences are looked at, they are done in a superficial way. For example, it too optimistically assumes that nearly all bioagents would be destroyed in a terrorist attack, and therefore too few would escape into the environment and pose a hazard to workers and the community. It makes this assumption without explaining any specific input parameters, such as velocity or weight. Because of these reasons, we believe that this revised EA should be withdrawn until the final guidance from DOE is released. This EA is obviously struggling from lack of guidance.

This revised EA references the U.S. Department of Energy's "Environmental Assessment for The Proposed Construction and Operation of a Biosafety Level 3 Facility at Los Alamos National Laboratory, Los Alamos, New Mexico," U.S. Department of Energy, National Nuclear Security Administration, Office of Los Alamos Site Operations, DOE/EA-1364 (February 26, 2002). This Los Alamos EA was withdrawn by NNSA in January 2004. NNSA should not rely upon this Los Alamos EA for both the original and the revised LLNL BSL-3 EA. The EA for the BSL-3 at Los Alamos was withdrawn because NNSA decided that a full EIS was needed. The full LANL BSL-3 EIS is due to be released in the summer of 2007 and renders the original LANL BSL-3 EA invalid. Please remove all references to the withdrawn LANL EA from this LLNL EA.

Moreover, in time NNSA agreed to prepare a more comprehensive environmental impact statement (EIS) for the LANL BSL-3. We submit that the same should be done for the LLNL BSL-3 given the Los Alamos example and the Ninth Circuit remand that DOE should consider an EIS. Additional reasons for an EIS are increasing indications of potentially greater seismic risks than previously acknowledged and the fact that the original and revised LLNL EA fails to disclose the true amounts of "Material at Risk" upon which risk calculations are predicated.

Advanced biodefense research (i.e., with bio-warfare agents like live anthrax and plague) should not be collocated with nuclear weapons research. If the U.S. mixes "bugs and bombs," it could complicate enforcement of the Biological Weapons Convention, the international treaty banning bioweapons. Please analyze the impacts of locating the biodefense research facility at a location other than at the Livermore Lab main site. The final EA should fully justify why DHS should not, or cannot, fulfill its needs at a non-nuclear weapons location. We formally state that we are not against enhanced national defenses against potential bioterrorism, which are regrettably necessary in today's world. However, we most seriously question whether a secret nuclear weapons site is an appropriate location for many reasons, foremost amongst them the possibly adverse international example it could set. Moreover, in light of the October 2001 anthrax attacks, we seriously question the ongoing proliferation of and increasing access to bioweapons agents. We hope to see those agents tightly controlled at a few consolidated sites, and again assert that DOE nuclear weapons sites are not suitable candidates.

The revised Environmental Assessment suggests that a potential terrorist would rather try to find dangerous pathogens in nature than attempt to steal them in larger, more concentrated quantities from the Livermore Lab BSL-3. Clearly the advantage of a person or persons with destructive intent that would want to obtain bio-

agents from the Lab is that these agents are pure, concentrated and in some cases already weaponized as an aerosol. Clearly the advantage is that they are pure, concentrated and in some cases already weaponized as an aerosol. These are exactly the steps one would need a biolab to perform. So it would be reasonable to try to obtain them after this work is already done at a lab.

Livermore Lab sits within a 50-mile radius of seven million people. This highly populated area is not an appropriate place to conduct experiments with some of the deadliest agents known. Please analyze the beneficial impacts of locating the biodefense research facility at a less populated area.

The revised Environmental Assessment does not analyze the environmental and health impacts of a release of the BSL-3's total inventory of up to 100 liters of bio-warfare agents. In fact, the revised EA fails to even disclose that other Livermore Lab and Department of Energy documents state the BSL-3 facility will house up 25,000 different samples of pathogens adding up to a total of 100 liters of bioagents at a time. Therefore, the hazard level posed by the Livermore Lab BSL-3 is far, far greater than the revised EA considers. All potential impacts should be calculated form the total amount of true Materials at Risk that could result from any catastrophic event, be it seismic or Intentional Destructive Acts.

Experiments will genetically modify bio-agents and aerosolize them (spray them) onto testing animals inside of special cabinets. The risks posed by genetically modified pathogens have never undergone a broad independent assessment. The lab will infect a maximum of 100 animals at a time, namely mice, rats and guinea pigs. Scientists and policy makers are concerned that genetic modifications could accidentally or intentionally create super-strains that have no known treatment or cure ultimately resulting in bio-weapons of the future. The environmental study conducted by the LLNL did not study the hazards of genetic modification.

The Department of Energy (DOE) should hold a public hearing so that the public can learn more about this plan and provide oral comments. So far, the number of public hearings that DOE has held on this important issue is ZERO. Please provide the opportunity for a public hearing and oral comment on the proposed LLNL BSL-3.

The 30-day written comment period (which ends May 11, 2007) is too short. Most area residents and other interested members of the public don't know about the comment period. It has not been widely publicized by the Department of Energy or Livermore Lab. Therefore, people are being deprived of their right to comment. The written comment deadline should be extended for a minimum of one additional month (to June 11). And, a public hearing (see above) should occur within the extended public comment deadline.

According to the DOE IG, the NNSA, a semi-autonomous agency within DOE, has made the decision to proceed with BSL-3 facilities at eight of its sites. Clearly, the potential risks are significant, given that theft of minute quantities can cause great public harm. In accordance with NEPA responsibilities and statutes, NNSA should and must prepare a Programmatic Environmental Impact Statement (PEIS) that collectively analyzes the cumulative impacts of its proposed BSL-3 facilities, with the Department of Homeland Security (DHS) as a cooperating agency. There is established precedence in that the U.S. Army completed an April 1989 final programmatic environmental impact statement on its Biological Defense Research Program. We believe that the NNSA and DHS as coordinating agency is under the same NEPA obligation to complete a PEIS, and should proceed to do so without delay. The LLNL BSL-3 EA should explain in detail the NNSA's and DHS' failure thus far to complete a PEIS, and how a continuing failure to do so would be justified.

Specific Comments
(Quotes from the revised LLNL BSL-3 revised EA are in italics.)

In response to this ruling and the guidance, NNSA has revised the 2002 EA to consider the potential impacts of terrorist activity. (Pg. ii)
Where is the final guidance? This revised EA should be withdrawn and re-revised when the final guidance is released.

Also since 2002, the proposed building has been constructed and all facility-related equipment installed. As such, NNSA acknowledges that the impacts related to construction that are discussed in this document have already occurred; these impacts were analyzed in the 2002 EA and considered in issuing the Finding of No Significant Impact (FONSI). (Pg. ii)
Please explain how the impacts of construction estimated in the 2002 EA compare to the actual impacts.

In accordance with the Ninth Circuit is remand, NNSA has reviewed the threat to the facility from terrorists and the potential environmental effects that might derive from various terrorist acts against the facility. Three terrorist acts were considered: 1) a terrorist attack resulting in facility damage; 2) a theft of pathogenic agent by a terrorist from outside of LLNL; 3) a theft of pathogenic agent by an insider. (Pg. v)
Why were these three terrorist acts chosen? Why only three?

NNSA believes that the probability of a successful terrorist attack on the BSL-3 facility is so uncertain that the possibility of such an event cannot be accurately quantified. (Pg. v)
DOE's interim guidance does not mention analyzing the probability of a terrorist act. This EA must analyze the consequences of accidents, not probability of accidents.

The EA concludes that the systems and technologies in the proposed facility would likely reduce the probability and consequence of a bio-terrorist act against the public in general. (Pg. v)
This is not the point. The idea that this BSL-3 may be making the world a safer place, or not, is not the purpose of this EA, or any EA.

Other minor changes have been made if guiding regulations or DOE policies have been updated since 2002. (Pg. v)
What are these?

The building would not be constructed over a known geologic fault or vertical displacement of a fault line, nor would it be sited within 50 feet of such a condition. (Pg. 11)

Accident scenarios usually envisioned for DOE facilities would normally be seen to exacerbate or enhance a release or spread of the hazardous materials, but for the BSL-3 facility would potentially render these materials innocuous (heat, fire, sunlight, and wind). These would be avoided when working with microorganisms and would usually result in microorganisms being killed. Consequently, catastrophic events such as earthquake, fire, explosions and airplane crashes, normally considered as initiating events in DOE radiological or chemical accident analyses, were viewed as having the potential to actually reduce the consequences of microbiological material releases. (Pg.52)
The use of the words "normally," "potentially," and "usually" is instructive. One of the key jobs of federal agencies under NEPA and under the DOE interim guidance is to analyze the risks of worse case scenarios and to analyze the explicit environmental consequences, which in this case should include physical breeches of facility containment and the prolonged loss of freezing capabilities. In a seemingly contradiction to the above categorical assertion, this revised EA notes how Coxiella burnetii (Q fever) is highly infectious and at the same time "remarkably resistant to drying and environmental conditions." (Pg. 54). This possible contradiction needs to be better explained to the public. The EIS must disclose all types and forms of microorganisms and infectious agents that might be present and the related risks of

handling each.

Moreover, the LLNL BSL-3 specifically acknowledges at page 23 that "some spores could be present in samples." Would there be spore forms of anthrax present at the facility, forms that are known to persistently survive in the open environment for decades at a time? There are also forms of tuberculosis in which the pathogens are known to survive in the open environment for extended periods of time. Would possible genetic modifications of pathogens and infectious agents at this BSL-3 facility possibly enhance their survival in the open environment? We find the 2002 environmental assessment's general assertion that catastrophic events would only serve to mitigate the risk to be far too quaint and self-serving. The risks of containment breeches need to be rigorously analyzed for all forms and types of pathogens and infectious agents that may be handled. It is not enough to simply wave away the potential risks by stating in effect that catastrophic events can only serve to lessen the threat.

Concerning the accident scenarios themselves, first, all risk analyses in the 2002 environmental assessment were essentially predicated upon the amounts of pathogens or infectious agents present during handling processes, an order of magnitude or more below what may actually be present at the facility. Risk analyses must be based on the total amount of inventory (which should be disclosed in the final EA), including storage. Frozen pathogens or infectious agents can obviously become Materials at Risk in the event of severe events, be they seismic or Intentional Destructive Acts, that cut off the electrical supply for extended periods of time (conceivably can even beyond the immediate diesel supply for emergency backup generators).

4.3 Analysis of Threat of Terrorist Activity

Environmental reviews prepared under CEQ implementing regulations and DOE NEPA regulations require a presentation of the environmental impacts of the proposed action and the alternatives in comparative form, thus defining the issues and providing a clear basis for choice among options by the decision-maker. With regard to intentional malicious acts, the assessment should compare potential impacts of acts by a terrorist that could derive from the proposed action, or that could occur with significantly greater probability as a result of the proposed action, to the potential impacts from those that could already occur if research with pathogenic agents requiring BSL-3 level containment is not conducted at LLNL (the "No Action" alternative). Pg. 57

The environmental effects of intentional destructive acts were not analyzed for the No Action Alternative, so no comparison was made. The environmental effects of intentional destructive acts must be analyzed for the No Action Alternative and a comparison of these effects must be compared to the Proposed Action.

Intentional malevolent acts, such as terrorist acts, do not lend themselves to the type of probability analysis conducted in NEPA documents for accidents (DOE 2002a). (Pg.58)

DOE 2002a refers to U.S. Department of Energy, "Recommendations for Analyzing Accidents under the National Environmental Policy Act", July 2002. This document states, "Analysis of such acts poses a challenge because the potential number of scenarios is limitless and the likelihood of attack is unknowable." (Pg. 20) This is the reason that DOE's interim guidance focuses on the environmental consequences and not on the probability of intentional destructive acts. This EA must do the same.

For a typical NEPA accident analysis, one would attempt to estimate the likelihood of a particular accident scenario. If it was high enough to warrant concern, one would then consider the potential consequences and analyze them accordingly. (Pg. 58)

Because the potential number of scenarios is limitless and the likelihood of attack is unknowable, DOE's interim guidance demands that this EA should examine the environmental consequences and not on the probability of intentional destructive acts. Intentional destructive acts do warrant concern and must be analyzed in detail.

Therefore in dealing with the potential for terrorism and its NEPA implications, NNSA has adopted an approach based on that which is used in designing security systems and protective strategies, where one begins with the assumption that a terrorist act will occur, regardless of the actual probability of such an act. Increasing levels of protective strategies are then put into place to reduce the risk of a successful terrorist attack to an acceptable level, and subsequently the potential for the facility to be an attractive target for terrorism. The conclusions of the NNSA in the analysis that follows reflect the influence of that approach. (Pg. 58)

One could postulate that catastrophic damage to the facility could be accomplished either by air or ground attack or by an individual gaining direct access to the building. (Pg. 58)
The environmental consequences of a ground attack should be analyzed in detail.

The potential impacts of these three scenarios were evaluated, including the potential impact that a successful terrorist attack would have. (Pg. 59)
The impacts of theft and release of pathogens was not explicitly analyzed.

For example, a suicidal plane crash could breach the facility's containment. Depending on the time of day and the type of research underway, a loss of containment could result in a release of pathogenic materials. It is probable that the organic biological material would be destroyed by any resulting fire (DOE 2002b). (Pg. 59)
DOE 2002b refers to the U.S. Department of Energy's "Environmental Assessment for The Proposed Construction and Operation of a Biosafety Level 3 Facility at Los Alamos National Laboratory, Los Alamos, New Mexico," U.S. Department of Energy, National Nuclear Security Administration, Office of Los Alamos Site Operations, DOE/EA-1364 (February 26, 2002). This Los Alamos EA was withdrawn by NNSA in January 2004. NNSA should not rely upon this Los Alamos EA for both the original and the revised LLNL BSL-3 EA. The EA for the BSL-3 at Los Alamos was withdrawn because NNSA decided that a full EIS was needed. The full LANL BSL-3 EIS is due to be released in the summer of 2007 and renders the original LANL BSL-3 EA invalid. Please remove all references to the withdrawn LANL EA from this LLNL EA.
The exact physics and input parameters of the plane crash analyzed must be stated. What type of plane? How much does it weigh? How much fuel was onboard? What was the speed of impact? What was the angle of impact? Was it a direct hit? Changes of any of these parameters would affect any loss of containment. Is NNSA implying that it does not need to mitigate the effects of a plane crash on this BSL-3 facility? NNSA has stated that this facility is a pre-manufactured building. This implies that it is probably a frame structure and not a masonry structure. Does a frame structure offer the best mitigation against a plane crash? A comparison of frame construction vs. masonry must be analyzed.

Similarly, an explosive device delivered by a vehicle or an individual on foot could breach facility containment with a subsequent partial release of the biological material. (Pg. 59)
Please explain in detail why this would only be a partial release. The exact physics and input parameters of the explosion analyzed must be stated. What type of explosive? How much explosive? What is the location of the explosion? Changes of any of these parameters would affect any loss of containment.

Impacts of a Release Following Loss of Containment. *Catastrophic events such as fire, explosions, and airplane crashes, normally considered as initiating events in NNSA radiological or chemical accidents, have the potential to actually reduce the consequences of microbiological material releases due to the heat produced by these events (DOE 2002b). (Pg. 59)*
This quote is a cut and paste from DOE's "Environmental Assessment for The Proposed Construction and Operation of a Biosafety Level 3 Facility at Los Alamos National Laboratory, Los Alamos, New Mexico," U.S. Department of Energy, National Nuclear Security Administration, Office of Los Alamos Site Operations, DOE/ EA-1364 (February 26, 2002). The background reference for this assumption is not stated in DOE 2002b. This Los Alamos EA was withdrawn by NNSA in January 2004. NNSA should not rely upon this Los

Alamos EA for both the original and the revised LLNL BSL-3 EA. The EA for the BSL-3 at Los Alamos was withdrawn because NNSA decided that a full EIS was needed. The full LANL BSL-3 EIS is due to be released in the summer of 2007 and renders the original LANL BSL-3 EA invalid. Please remove all references to the withdrawn LANL EA from this LLNL EA.
Explosions differ from fires or airplane crashes. An explosion could breech containment without a resulting fire and should be analyzed separately. One of the key jobs of federal agencies under NEPA is to analyze the risks of worse case scenarios, which in this case should include physical breeches of facility containment and the prolonged loss of freezing capabilities. It is noted how Coxiella burnetii (Q fever) is highly infectious and at the same time "remarkably resistant to drying and environmental conditions." This possible contradiction needs to be better explained to the public. The EIS must disclose all types and forms of microorganisms and infectious agents that might be present and the related risks of handling each. Would there be spore forms of anthrax present at the facility, forms that are known to persistently survive in the open environment for decades at a time? There are also forms of tuberculosis in which the pathogens are known to survive in the open environment for extended periods of time. Would possible genetic modifications of pathogens and infectious agents at this BSL-3 facility possibly enhance their survival in the open environment? We find the environmental assessment's general assertion that catastrophic events would only serve to mitigate the risk to be far too quaint and self-serving. The risks of containment breeches need to be rigorously analyzed for all forms and types of pathogens and infectious agents that may be handled. It is not enough to simply wave away the potential risks by stating in effect that catastrophic events can only serve to lessen the threat.

The remaining material would be stored in freezers. (Pg. 59)
Freezers may pose a different type of environmental consequence and must be analyzed separately.

An explosion with a subsequent fire would result in a lower risk than without a fire because much of the biological material available for release would likely burn or be killed by heat rather than released to the environment (DOE 2002b). Breach of containment in the absence of an explosion is likely to rupture containers of disinfectant, such as bleach, which would also reduce the amount of viable agent expected to escape the facility following the attack. (Pg. 59)
Will bleach be keep in the freezers? Please explain in detail the physics involved of bleach and pathogens being in the same explosion.

Risk Group 2 and Risk Group 3 agents proposed for use in the facility cause human diseases for which preventive or therapeutic interventions may be available. (Pg. 60)
The environmental consequences of the release of Risk Group 1 agents and the release of Risk Group 2 and 3 agents for which there are no preventive or therapeutic interventions must be analyzed.

In general, considering the current levels of security awareness and response available, it is probable that if a successful terrorist attack on the facility resulted in the release of a biological agent to the environment, the effects of such a release would be localized in time (hours immediately following the terrorist act) and place (downwind from the BSL-3 facility). (Pg. 60)
What is the basis for these statements? Where is the detailed analysis? How many people live downwind? With respect to "localized in time," we again note that bioagents spores could be present in samples.

As noted, exposed individuals could be inoculated to prevent infection or treated to assist in recovery. For example, studies (DA 1989) reported that if a non-immunized person were exposed to defined aerosols of up to 150,000 pathogenic doses of virulent C. burnetii, the disease could be avoided by giving one milliliter of vaccine within 24 hours after exposure and by instituting antibiotic therapy. (Pg. 60)
Are vaccines for every pathogen proposed for this BSL-3 facility available? Are the local hospitals equipped? One of the purposes of this EA must be to consider measures to minimize the consequences of a potential terrorist attack.

Thus, a knowledgeable terrorist could collect environmental samples of many Risk Group-2 or Risk Group-3 microorganisms and grow large quantities of them for dissemination without attacking or stealing from a government or private BSL-3 facility. This is clearly different than the analogous risk to the security of high-level radioactive spent fuel rods at a nuclear power plant, as those "source materials" are uniquely concentrated radioisotopes that are not readily obtainable or producible and cannot be "grown" to larger volume from a minute sample. (Pg. 63)

This whole line of analysis is outside the bounds of explicitly addressing potential environmental consequences of intentional destructive acts required by the DOE interim guidance. As for the rationale for why a person or persons with destructive intent would want to obtain bioagents from the Lab, clearly the advantage is that they are purer, more concentrated and in some cases already semi-weaponized as an aerosol. These are exactly the steps one would need a biolab to perform. So it would be reasonable to try to obtain them after this work is already done at a lab. It is specious for NNSA to repeatedly claim that it would be more attractive to malefactors to collect bioagents from nature (sheep ranches, etc) than it would be to target advanced biolabs for illicit diversion. This claim would be amusing, were it not for the serious unresolved questions directly relevant to national security that remain after the October 2001 anthrax attacks.

And while the theft of pathogenic materials by an insider from any bio research facility could have very serious consequences, this scenario is not expected to occur at LLNL due to human reliability programs, security procedures, and management controls at the facility and the laboratory. (Pg. 66)

These very serious consequences must be analyzed and not so summarily dismissed. "Not expected" is not good enough when the seminal incident that prompted accelerated security concerns, i.e. 9.11, was not "expected" either. We point out that Livermore's sister laboratory Los Alamos, managed by the University of California as well, also has human reliability programs, security procedures, and management controls. Those programs and procedures didn't stop an archivist with a known association with a confessed methamphetamine addict from committing serious security infractions. The future good morale of employees at both labs can be questionable. We add again the unsolved October 2001 anthrax attacks. While the specific source of the anthrax strain used in those attacks remains unknown, it is a possibility that can't be dismissed that it came from the highly secure biological facilities at Ft. Dietrich. Potential "insider jobs" need to be treated with the utmost seriousness and rigor of analysis in order to nearly guarantee their prevention.

5.0 CUMULATIVE EFFECTS

Cumulative effects on the environment result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes them. These effects can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7). This section considers the cumulative effects resulting from the implementation of the Proposed Action and reasonably foreseeable future actions in the Building 360 Complex Area and adjacent lands. Readers of this document should note that since this EA was originally issued, DOE has issued the Final Site-wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SWEIS, DOE/EIS-0348, DOE/EIS-0236-S3, DOE 2005). This document contains an extensive discussion of the cumulative effects of LLNL operations, which includes this facility.

LLNL Operations at the Building 360 Complex Area. *No new types of operations and very few, if any, new personnel would be introduced into LLNL as a result of the Proposed Action. Land use within the Building 360 Complex Area would remain unchanged. Local traffic congestion would be unaffected by the Proposed Action since there would be no net increase expected in the number of workers for the Complex Area. Pg. 68*

The cumulative effects of the environmental consequences of intentional destructive acts that release biological pathogens and radiological isotopes at the same time must be analyzed for this EA.

The first, scenario for a BSL-3 facility in Ohio (BMI 1993), involved an accident that resulted in a release of exotoxin from the common soil pathogen, Clostridium botulinum. Three different toxins were planned for use in the facility (botulinum, ricin, and Staphylococcal enterotoxin B), but botulinum toxin was chosen because it was determined to be the most toxic of the three. The scenario involved the release of an aerosol equivalent in amount to one of their standard tests in the interior of a Class III BSC followed by release through the cabinet filtration system. The BSC exhausts through two HEPA filters in series with each removing 99.97 percent of the aerosol. The EA analysis also considered an accident relating to microorganism handling in which the organisms were not contained within a BSC as not being a credible accident since the only open culture handling, including packaging and un-packaging, is done inside their BSCs. They similarly discounted fire, explosion, loss of ventilation control, airplane crash, earthquake, and flooding as also not being credible events to initiate accidents. They determined that there was no effect on humans due to the release which was several orders of magnitude lower than the no-effect dose (BMI 1993). (Pg. B-8)

First, in its 2004 report to Congress the Defense Nuclear Facilities Safety Board wrote (page 4-4) "The Board identified many weaknesses in DOE's program for the use of High Efficiency Particulate Air (HEPA) filters in safety applications." Thus, we are skeptical of the DOE's claimed HEPA efficiencies and which DOE needs to better support with updated tests that the Department promised DNFSB would be performed.

Sincerely,

Jay Coghlan
Scott Kovac
John Witham
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Mon, Sep 9, 2002 10:41 AM

From: Mortensen, Rich <rich.mortensen@Oak.doe.gov>
To: 'Colin King' <colinking@nukewatch.org>
Date: Monday, September 9, 2002 10:34 AM
Subject: RE: NWNM Comments on LLNL BSL-3 EA

Dear Mr. King-

This is to acknowledge receipt of your comments regarding the proposed Biosafety Level 3 facility at Lawrence Livermore National Laboratory. Your concerns will be addressed as we finalize the Environmental Assessment for the facility and you will receive a written response addressing those concerns.

Richard Mortensen

DOE NEPA Document Manager

US DOE, Livermore Site Office, M/S L-293

PO Box 808

Livermore, CA 94551

Page 1 of 1

nuclear watch new mexico

September 7th, 2002

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Dear Mr. Mortensen,

Nuclear Watch of New Mexico (NWNM) submits the following comments on the draft Environmental Assessment (EA) (DOE/EA-1442) for The Proposed Biological Safety Level (BSL)-3 Laboratory at Lawrence Livermore National Laboratory (LLNL).[1] NWNM greatly appreciated your consideration of a comment period time extension and then your rapid granting of that extension.

Purpose and Need Factually Misleading

The Purpose and Need for Agency Action is self serving and factually misleads members of the public and decision makers in such a manner that it completely fails to fulfill the National Nuclear Security Administration's (NNSA) obligations under the 1969 National Environmental Policy Act, 42 U.S.C. § 4321, et seq. (NEPA). NWNM asserts that the Purpose and Need for Agency Action is hinged upon "NNSA mission requirements" which have never undergone a NEPA review.[2] Until a complete NEPA review of the NNSA Chemical and Biological National Security Program (CBNP) is conducted, the proposed agency action at LLNL is without justification. The need for a Programmatic Environmental Impact Statement (PEIS) will be addressed further on in these comments. Furthermore, the Draft EA makes the claim that "The importance of work performed for NNSA in bioscience research and development in support of its national security WMD [weapons of mass destruction] non-proliferation mission is increasing."[3] The EA goes on to say that "DOE [Department of Energy] does not currently have under its administrative control within the DOE complex any microbiological laboratory facility capability beyond BSL-2, but BSL-3 laboratories are proposed at Los Alamos National Laboratory."[4,5] The Purpose and Need does not take into account the fact that the DOE willreportedly begin construction of the Los Alamos facility in October 2002. Furthermore, the only significant difference between the LLNL proposed action and the LANL action is LLNL's addition of a 3rd BSL-3 laboratory which will house rodent cages and the capability to conduct aerosol challenges on those rodents.[6] The LLNL Draft EA goes on to claim that "Work at each of the national laboratories is expected to compliment rather than be duplicated at each of three national laboratories."[7] If that is the case, why propose a facility that is in many respects duplicative of the LANL facility? Why not construct a facility with two BSL-3 laboratories, one for aerosol challenges (which does not duplicate capabilities at LANL) and another for non-aerosol related support work? Obviously, LLNL needs to further clarify why the proposed facility does not represent a duplicative action to LANL's action. Should LLNL fail to do, it would not have met the requirements promulgated under NEPA.

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Facility Safety and Security

1. General Comment

NWNM finds the omission of preliminary safety and security plans and procedures as part of the NEPA review process a grave oversight. While we recognize that such documents are "living" and subject to change, preliminary plans should be included in the NEPA discussion for the very reason that LLNL will use these non-existent documents as basis for the determination of the Finding of No Significant Impact (FONSI). Basing a FONSI on non-existent safety plans avoids the "hard look" at socio-environmental impacts that NEPA requires. Furthermore, there is no evidence that LLNL has conducted a preliminary hazards analysis (PHA) for the proposed facility. Because of the precedence of the proposed facility, the omission of even a simple PHA is an egregious oversight that puts into question the entire NEPA process for the proposed LLNL action, particularly when these essential documents "would provide the key documentation framework for the operation of the BSL-3 facility."[8] Nor would it suffice for the agency to incorporate by reference, or any other method, the PHA prepared for the EA on the proposed BSL-3 facility at Los Alamos National Laboratory (LANL) because the proposed LLNL facility incorporates a single but substantial difference in facility design. Namely, one laboratory in the proposed LLNL facility is designed for aerosolization challenges and the LANL facility cannot conduct any type of work that would produce anything other than incidental aerosolization.[9,10]

2. Physical Security

The Draft EA states "Physical security of the facility building would be implemented commensurate with the level of work being performed. The facility safeguards would be based upon a security analysis conducted during the project planning stage."[11] The NEPA documentation (a significant aspect of all planning) for a facility such as the proposed, one that will conduct research on biological agents "historically used for bioweapons," should include more than a cursory discussion of the physical security safeguards that would be taken at the facility.[12] Additionally, a recent Congressional study found that the armed guard forces level for LLNL has dropped by 12 percent.[13] How will LLNL addresses these two issues, first that LLNL proposes to hold inventories of biological agents that have bioweapons applications which makes the proposed facility a desirable target for theft or even attack by terrorists (particularly given its proximity to high density populations), and secondly that the armed forces guarding LLNL have decreased over the past decade? This matter requires consideration, and though NWNM does not believe that specific details should be released that could conceivably jeopardize facility security, a general discussion of preliminary security measures must be included in the EA. The Draft EA fails to do this.

3. Catastrophic Events

Terrorism

Nowhere in the LLNL Draft EA is there is discussion of the risks associated with terrorism, or any possible method to mitigate such risks. Traditionally terrorist acts have not been considered as reasonably foreseeable events in DOE NEPA analyses. But in the post 9/11 world, that can no longer be claimed, and DOE and NNSA are themselves reluctantly admitting the security risks their activities face against this emerging threat.[14] As is stated above, the proposed biological agents to be studied at the LLNL BSL-3 facility are those that are historically used for bioweapons. This makes them of great potential interest to terrorists. Furthermore, given the proximity to the large population center of the Bay Area, the proposed LLNL BSL-3 is an even more desirable target for terrorists. Though recognizing that threats such as acts of terrorism are poorly defined, measures

must be taken in order to address the more plausible avenues of attack. A general description of these measures (while at the same time NWNM recognizes the need for caution when describing these measures) MUST be included in the NEPA analysis of this proposed facility. NNSA has fallen into the realm of complete irresponsibility by failing to address this grave danger.

Unlike the NNSA, the U.S. Department of the Army (DA) addresses this issue in a comprehensive manner, even though the DA asserts that the chance of terrorist attack is not "reasonably foreseeable." In its Final Environmental Impact Statement (FEIS) for the Life Sciences Test Facility (LSTF) at Dugway Proving Grounds, Utah, the DA did provide an analysis of the risks associated with terrorism, and discussed how the DA would minimize those risks.[15] The DA states that "The possibility exists that sabotage could be directed at the LSTF with intent to cause a release of biological materials. However, several factors prevent or mitigate the likelihood that a saboteur would gain access to the LSTF." Those factors, in summary, are:

LSTF is a great distance from the patrolled Dugway Proving Ground perimeter,
A manned guardhouse on the road at perimeter entrance,
A second guardhouse is located at the entrance to the technical area that is home to the LSTF,
A personal and vehicle checkpoint,
An intrusion detection system will surround LSTF,
Card reader devices for BSL-2 and BSL-3 areas,
Only 3 people will have direct access to biological material storage area.[16]

Furthermore, as was demonstrated by news headlines on www.msnbc.com, even the formidable security features of DPG can be breached. According to DPG and msnbc.com reports, a single man was able to gain access to the massive chemical weapons storage and disposal sites.

Internal Threats

As more evidence becomes available, it is clear that at least the *bacillus anthracis* used in the October 2001 anthrax attacks was cultured from the U.S. Ames Strain. Furthermore, evidence suggests that the *b. anthracis* was from a U.S. biological defense research laboratory, presumably one operated by the DA. In FEIS for the LSTF, the DA considered both acts of terrorism as well as internal employee sabotage and/or theft.[17] The point here is obvious for the careful reader. The DA considered terrorism and internal sabotage possible threats a decade before terrorists attacked on U.S. soil. Though the DA did not believe that such events were initiating, in terms of NEPA analyses, they did nevertheless provide a fairly detailed discussion of the methods that would be used to mitigate such risks. The DA states that "a disgruntled, emotionally distraught, or disloyal employee theoretically could gain the required confidence of coworkers to obtain and release materials maintained at the LSTF. Of primary public health and environmental concern is the possibility that an employee might secretly remove materials from the facilityand disseminate them in public places or the environment."[18] Clearly the stakes are greater in the post 9/11 world and after the October anthrax attacks, and consideration of both terrorism and internal threats must be considered in LLNL's NEPA analysis for the proposed BSL-3 facility.

Earthquakes

NWNM is not satisfied with the analysis given to the threat of earthquake damage to the facility. The Draft EA makes unsubstantiated claims and uses references (such as the DA) which upon more careful examination do not paint the picture as black and white as the Draft EA makes it out to be. LLNL's Draft EA asserts that "Accident scenarios usually envisioned for DOE facilities would normal-

ly be seen to exacrbate or enhance a release or spread of the hazardous materials, but for the BSL-3 facility would potentially render these materials innocuous (heat, fire, sunlight, and wind). These would be avoided when working with microorganisms and would usually result in microorganisms being killed. Consequently, catastrophic events such as earthquake, fire, explosions and airplane crashes, normally considered as initiating events in DOE radiological or chemical accident analyses, were viewed as having the potential to actually reduce the consequences of microbiological material releases."[19] Though portions of this statement ring true to the DA's findings, such as extreme fire and explosion, coupling this claim with the statement that "The probability of catastrophic events (due to earthquake) is already very low" grossly misrepresents the conclusions that the DA came to in their study of the Dugway Proving Ground (DPG), which is in a very seismically active area.

The DA found that DPG was at risk to a local ground motion at its LSTF of "5.6 to 6.9 on the Richter scale." The DA considered the chances of such an event has a probability of occurring once every 100 years, at a minimum.[20] In its Seismic Risk Analysis, the DA found that the most likely event would be from a distant fault with high attenuation in the direction of the LSTF. The DA stated that "Because the consequences of an LSTF facility failure related to a seismic event would be severe, the design parameters should reflect the worst event regardless of the probability of occurrence." The DA continued by stating that the distant Wasatch Fault has an acceleration attenuated to the site of between 0.35 and 0.45 g associated with a 250 year event and a velocity range between 35 and 45 cm/sec. From the implied Modified Mercalli Intensity Scale, it can be assumed that a velocity range between 0.35 and 0.45 g would result in an event between VIII and IX intensity at the LSTF site. Considerable damage to buildings and even ground cracking may be expected at these intensities." [21,22] These findings prompted the DA to conclude that LSTF must be constructed to the highest seismic building codes.

Arguably, the region surrounding the DPG complex is less seismically active than that surrounding the San Francisco Bay Area. According to a recent study conducted by the U.S. Geological Survey (USGS), the Bay Area has a "70 percent chance of an earthquake of 6.7 or greater" on the Richter scale from 2000 to 2030.**[23]** The Mount Diablo Thrust, Greenville, and Calaveras Faults have a combined probability of 37 percent chance of 6.7 or greater event (including a 9 percent chance of occurrence for unknown or unmapped faults in the region).[24] All these faults run in very near proximity to the LLNL. An event of such a magnitude would be at least a Modified Mercalli Intensity Scale IX, the highest probability considered by the DA. Furthermore, the chances are much greater that events of this magnitude will occur at the LLNL site than the DPG site. In 1980, a 5.9 event occurred on the Greenville fault that caused $10 million worth of damage to the LLNL, according to the USGS.[25] This event registered VII on the Modified Mercalli Intensity Scale, at least a magnitude smaller than the probable event forecasted to occur during the life-cycle of the proposed BSL-3. Yet, this event still caused substantial damage to LLNL and the surrounding region.

Given this evidence, it is inexcusable that LLNL does not provide a thorough seismic risk analysis for its proposed BSL-3 facility. Further, the DA's findings for potential aerosol release are not entirely applicable to the proposed LLNL BSL-3 facility. Though it would require a substantial amount of energy to aerosolize microorganisms in the proposed BSL-3 facility, conceivably an event of 6.7 magnitude (M) or greater could provide that energy. The Draft EA provides no explanation as to why this scenario (certainly a 37 percent chance over a 30 year period is a credible event) was not considered. Given the population density of the LLNL complex and its locale to the city of Livermore, there is a heightened risk of worker and public exposure resulting from a catastrophic event such as a 6.7M or

greater event. Aerosol clouds would not have to travel the great distances that were analyzed in the DA DPG FEIS, thus making it much more likely that the required human infectious dose (HID) would still exist when the aerosol cloud reached members of the populace.

HEPA Filters

Proper HEPA filtration is essential to the safe operation of the proposed LLNL BSL-3 facility. Yet, there is no description of how LLNL will ensure that HEPA filters are installed properly. Proper installation is vital to the effectiveness of HEPA filters. The DOE has been plagued by sloppy HEPA filter installation and maintenance as is evidenced by historical documents. It behooves LLNL to demonstrate an effective plan that will ensure that HEPA filters are installed properly, are functioning as designed, and furthermore, there should be some kind of warning system that would alert the BSL-3 personnel should the HEPA filter bank fail.

Additionally, what is the size range for the proposed microorganisms or related aerosol particles? Reportedly, HEPA filtration efficiency diminishes down to 90 percent when particles are 0.1 micron. Do any of the proposed microorganisms fall within that range?

4. Facility Size

The Draft EA states that "The BSL-3 facility would not be a large-scale research or production facility, which is defined as working with greater than 10 liters of culture quantities."[26] Yet, according to cited Centers for Disease Control (CDC) definitions, the proposed LLNL BSL-3 facility is certainly not a small facility.[27] The LLNL Draft EA states that only 6 workers occupying the facility.[28] How many of these workers would simultaneously act as principle investigators (PI)?

5. Biological Fermentor

What role, if any, will the Environmental Microbial Biotechnology Facility's 1500 liter biological fermentor play in microorganism research at the proposed BSL-3? Given the reportedly close proximity to the proposed BSL-3 facility, this could present a bad international example of U.S. commitment to the Biological and Toxin Weapons Convention. What assurances will LLNL give that this biological fermentor will not be used for industrial scale production of biological select agents or other types of genetically modified microorganisms that have potential weapons applications?

The Need for a Programmatic EIS For the NNSA's Chemical and Biological National Security Program

The National Nuclear Security Administration (NNSA), lead agency for the LLNL BSL-3 Draft EA, has already initiated a well defined program through its Chemical and Biological National Security Program (CBNP). The CBNP was created in 1996 when Congress passed the Defense Against Weapons of Mass Destruction Act, 50 U.S.C. § 2301, et seq. The CBNP is rapidly growing, for example: "Significant progress was made over the past year; partly because program funding was doubled from the FY99 level" [29] and the "CBNP budget increased from $18.5 M in FY 99 to $40.0 M in FY00 and retained that increase for FY01 ($42.1 M)."[30] Nor does the CBNP funding tally appear to capture the total cost for DOE activities with biological select agents. The DOE Office of Inspector General estimates that "the cost in FY 2000 of the Department's biological agent-related activities was in excess of $90 million."[31] In any event, total program funding will no doubt dramatically increase in FY02 following the recent terrorist and anthrax attacks.

This program is not new. As the NNSA states "The CBNP was initiated in 1997" with a clear "mission focus" for which "the development of requirements is a complex challenge involving governmental and non-governmental organizations at national, state and local levels."[32] The NNSA has developed a CBNP Strategic Plan [33] and recognizes that future "*programmatic* challenges" exist.[34] DOE Albuquerque officials have on at least one occasion undertaken "*programmatic* review of pertinent program documents." [35] (Emphases added.) The CBNP is multi-laboratory and spread across the nation. Those facilities identified by the DOE Office of Inspector General as having conducted biological experiments are the Brookhaven, Lawrence Berkeley, Lawrence Livermore, Los Alamos, Sandia-CA, Sandia-NM, Oak Ridge, Pacific Northwest and Idaho Engineering and Environmental National Laboratories.[36] Additionally, "Department laboratories are conducting Work-for-Others programs, Laboratory Directed Research and Development projects, and Cooperative Research and Development Agreement projects involving biological select agents and select agent materials." [37] As further indication of the reach of its potential impacts, the CBNP has already experimented on a large metropolitan and geographical area (Salt Lake City and the Great Salt Lake Basin).[38]

In sum, the CBNP is a large and rapidly growing program to which the NNSA has already committed "irretrievable resources." The program has numerous facilities located across the country that, by virtue of the materials that they work with, can have large potential impacts that could "significantly" affect the "human environment." [39] Yet, in what appears to be a clear violation of the National Environmental Policy Act (NEPA), the CBNP has not undergone public programmatic review. In these comments, NWNM attempts to make clear that that programmatic review is required.

In February 2001 the DOE Office of Inspector General released a report entitled "Inspection of Department of Energy Activities Involving Biological Select Agents." Under RESULTS OF INSPECTIONS, that office concluded:

> [T]he Department's biological select agent activities lacked organization, coordination, and direction. Specifically, the Department's activities lacked appropriate Federal oversight, consistent policy, and standardized implementing procedures, resulting in the potential for greater risk to workers and possibly others from exposure to biological select agents and select agent materials.[40]

As a result of its inspections the DOE IG Office made four primary recommendations to the DOE Under Secretary for Energy, Science, and Environment and the DOE Under Secretary for Nuclear Security [i.e., the NNSA]. The DOE IG Office recommended them to jointly:

> 1. Identify the types and locations of activities being conducted by the Department involving biological select agents and select agent materials.
> 2. Initiate actions to ensure: (a) appropriate federal oversight; (b) consistency in policy; and (c) standardization of implementing procedures for biological select agent activities being conducted by the Department. Actions, for example, could include encouraging more interagency cooperation in this area and, similar to the approach taken by the United States Army, supplementing CDC [Centers for Disease Control and Prevention] guidance regarding activities involving biological select agents and select agent materials to address situations unique to DOE.
> 3. Ensure that required NEPA reviews are conducted prior to the start of biological select agents and select agent materials and revised, as needed, when significant changes occur in the activities.

> 4. Initiate appropriate action to ensure the Department's laboratories, including those managed by the NNSA, receive timely and consistent information regarding CDC guidelines.[41]

The DOE IG report states that the Acting Director of the NNSA Chemical and Biological National Security Program generally concurred with all four recommendations. Specifically on the issue of NEPA compliance, the DOE IG report says that the "Acting Director stated that the Department is *required* to comply with NEPA. He stated that the Department will 'continue to address biological research within individual laboratory annual planning summaries and *otherwise according to Department requirements'* to ensure that that appropriate consideration is given to NEPA compliance *early in the planning process*." [42] (Emphases added.)

On the subject of "otherwise according to Department requirements," DOE NEPA Implementation Regulations, §1021.330, "Programmatic (including Site-wide) NEPA Documents," states:

> (a) When required to support a DOE programmatic decision (40 CFR §1508.18 (b) (3)), DOE shall prepare a programmatic EIS or EA (40 CFR §1502.4). (Emphasis added.)
> (b) A DOE programmatic NEPA document shall be prepared, issued, and circulated in accordance with the requirements for any other NEPA document, as established by the CEQ regulations and this part.

The above referenced 40 CFR §1508.18 (b) (3), "Major Federal action," states

> (b) Federal actions tend to fall within one of the following categories: …
> (3) Adoption of programs, such as a group of concerted actions to implement a specific policy or plan; systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive.

The above referenced 40 CFR §1502.4, "Major Federal actions requiring the preparation of environmental impact statements," states

> (a) Agencies shall make sure the proposal which is the subject of an environmental impact statement is properly defined. Agencies shall use the criteria for scope (§1508.25) to determine which proposal(s) shall be the subject of a particular statement. Proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement.
> (b) Environmental impact statements may be prepared, and *are sometimes required, for broad Federal actions such as the adoption of new agency programs* or regulations (§150.18). Agencies shall prepare statements on broad actions so that they are relevant to policy and are timed to coincide with meaningful points in agency planning and decision-making. (Emphasis added.)

The above referenced 40 CFR, §1508.25, "Scope," states

> To determine the scope of environmental impact statements agencies shall consider 3 types of actions, 3 types of alternatives, and 3 types of impacts. They include:
> 1. Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:…
> (iii) Are interdependent parts of a larger action and depend on the larger action for their justification.

Under "Purpose and Need for Agency Action " the Draft LLNL BSL-3 EA says that "DOE con-

ducts bioscience work at LLNL in support of its national NNSA security and science missions and in support of the CBNP [Chemical and Biological National Security Program] … NNSA needs BSL-3 laboratory capability located at LLNL." Thus, it is self-evident that the proposed LLNL BSL-3 is an interdependent part of a larger federal action, which is the NNSA's Chemical and Biological National Security Program. In turn, the proposed LLNL BSL-3 laboratory depends upon that program for its justification. It is also self-evident that the CBNP is a major federal action that has the potential to significantly affect the human environment. Just because the CBNP is an ongoing program that has not yet been programmatically reviewed under NEPA does not excuse it now from review. As NEPA states: "Actions include the circumstance where the responsible officials fail to act and that failure is reviewable by courts or administrative tribunals under the Administrative Procedures Act or other applicable law as agency action." [43]

The Department of Energy declares that "It is DOE's policy to follow the letter and spirit of NEPA; comply fully with the CEQ [Council on Environmental Quality] regulations; and apply the NEPA review process early in the planning stages for DOE proposals."[44] In contradiction, DOE's NEPA history is replete with major violations and failures to act.[45] Our present concern is further heightened by revelations that the NNSA's Chemical and Biological National Security Program has already arguably violated NEPA procedures at two of its facilities, the Chem-Bio Facility under construction at the Oak Ridge National Laboratory (proposed as a BSL-3 facility but without an environmental assessment) and a facility at Sandia-NM (whose original scope of work had significantly changed without related NEPA review).[46]

DOE was forced by citizens to prepare a Stockpile Stewardship and Management (SSM) PEIS for public review of Departmental proposals to consolidate and revitalize its nuclear weapons complex. That 1996 document said:

> This PEIS has been prepared in accordance with section 102(2)(c) of the *National Environmental Policy Act* (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.), and implemented by regulations promulgated by the Council on Environmental Policy (CEQ) (40 CFR 1500-1508) and DOE regulations (10 CFR 1021). Under NEPA, Federal agencies, such as DOE, that propose major actions that could significantly affect the quality of the human environment are required to prepare an environmental impact statement (EIS) to ensure that environmental information is available to public officials and citizens before actions are taken. *For broad actions*, such as the Stockpile Stewardship and Management Program, *a PEIS is prepared.* [47] (Emphasis added.)

Under the same NEPA requirements it should be noted that the DOE has also prepared a Waste Management PEIS, a Storage and Disposition of Weapons-Usable Fissile Materials PEIS and a Tritium Supply and Recycling PEIS.

From the perspective of required programmatic review under NEPA, Nuclear Watch of New Mexico asserts that there is little difference between the Stockpile Stewardship and Management Program and the Chemical and Biological National Security Program. Both were explicitly new programs involving the significant commitment of irretrievable resources and potentially significantly affecting the human environment. Yet one received programmatic NEPA review and one still has not. We hereby make the claim that the NNSA is required under NEPA to prepare a CBNP PEIS, and the agency should act quickly to do so.

Despite what seem to be clear NEPA requirements, the NNSA may still be loath to undertake a CBNP PEIS. The NNSA should be aware that public comment can be of great direct benefit to the agency. One example is that when DOE prepared a draft Los Alamos National Laboratory (LANL) Site-Wide EIS in 1998, these writers commented that the risk of wildfire was completely omitted (an incredible omission!). DOE subsequently included in the 1999 Final LANL Site-Wide EIS a risk analysis of a model fire that eerily matched the all-too-real Cerro Grande Fire of 2000. As a result, the lab took some fire prevention measures that, among other things, helped to keep the waste dumps and storage areas at Technical Area-54 from burning. In the informal words of the director of the LANL's fire rehabilitation project, the existence of that wildfire risk analysis saved the lab three critical days in determining appropriate emergency response measures while the fire raged. That analysis would not have existed without the NEPA process and related public comment.

Should the NNSA amicably agree to prepare a CBNP PEIS, Nuclear Watch of New Mexico contends that the SSM PEIS can serve as a useful model in a number of ways. First of all, the SSM PEIS provided a forum in which DOE could lay out its rationale and justification for the SSM Program. This is of analogous importance to the CBNP in that one of the major concerns expressed by the public over the proposals DOE has put forth for BSL-3 facilities is the propriety of locating a biological research facility at an institution whose historic mission has been the research and development of deliverable nuclear weapons. At the same time this is an issue that the mere appearance of which can be of international significance. DOE has emphatically and repeatedly denied that its future BSL-3 facilities would ever be used for offensive purposes. A CBNP PEIS would help to lay the programmatic foundation for such assurances. Moreover, a CBNP PEIS could help build public and international confidence through discussion of the international treaty framework governing biological select agents and by institutionalizing transparency measures for the entire program under that framework.

Another way that the SSM PEIS can serve as a useful model is that that document served both as a programmatic review and facility-specific review. This is to suggest that in the course of a CBNP PEIS the NNSA could simultaneously prepare the programmatic review that we believe NEPA clearly requires and still move forward as appropriate in the NEPA process for both the LLNL and LANL BSL-3 facilities.

A CBNP PEIS can also serve to promote needed interagency cooperation. To again quote the DOE IG Office's second recommendation, the NNSA should:

> 2. Initiate actions to ensure: (a) appropriate federal oversight; (b) consistency in policy; and (c) standardization of implementing procedures for biological select agent activities being conducted by the Department. Actions, for example, could include encouraging more interagency cooperation in this area and, similar to the approach taken by the United States Army, supplementing CDC guidance regarding activities involving biological select agents and select agent materials to address situations unique to DOE.

In Nuclear Watch of New Mexico's view, the CDC should be designated as a "cooperating agency" in a CBNP PEIS and not merely as a "supporting agency." As the lead agency in this NEPA process, the NNSA should request that designation.[48] The NNSA should be advised that to have the CDC's active participation in these NEPA processes would undoubtedly go a long ways towards alleviating public concerns over safety and health issues. In addition, given that the CDC is reportedly chronically under-funded, the NNSA should help financially support the CDC in any role that it might play as a cooperating agency.

Again in reference to the DOE IG's second recommendation (specifically to the phrase "similar to the approach taken by the United States Army") it needs to be noted that the U.S. Army prepared and released in April 1989 a Final Programmatic Environmental Impact Statement on its Biological Defense Research Program (BDRP).[49] Under "Description of the BDRP," the Army states that the "objectives of the BDRP are to develop measures for detection, treatment, protection and decontamination of potential biological warfare threat agents."[50] In a broadly similar mission, the "DOE Chemical and Biological National Security Program (CBNP) was initiated in FY1997 to engage the DOE and its laboratories more fully in the development and demonstration of new technologies and systems to improve U.S. domestic preparedness and response capabilities to chemical and biological attacks."[51] Like the Army's program, the NNSA's Chemical and Biological National Security Program is multi-facility across the nation, with the potential for significant impacts on the human environment. The Army found its PEIS "an excellent approach for considering unscheduled, unidentified future implementing actions that may have environmental impact," [52] acknowledged that the "jurisdiction" of its PEIS was "[n]ationwide," [53] and fulfilled its statutory NEPA obligations through the completion of its PEIS. In Nuclear Watch of New Mexico's view the DOE is under the same NEPA obligation to prepare a PEIS on its Chemical and Biological National Security Program, and should proceed to do so without delay.

The NNSA may perhaps argue that the present national security climate following the September 11 and anthrax attacks does not allow for the "luxury" of a programmatic EIS on its Chemical and Biological National Security Program. Even though we too recognize the increasing need for enhanced national defenses against the threat of chemical or biological attack, Nuclear Watch of New Mexico would argue otherwise. Obviously other governmental programs now exist (even present day activities at LLNL) that are addressing current issues. Also obvious is the fact that all federal agencies, even in today's security climate, are still obliged to comply with NEPA. Moreover, as the SSM PEIS illustrates, programmatic review and facility review can still occur simultaneously. Therefore, the preparation of a PEIS is not an insurmountable obstacle to the NNSA's pursuit of a BSL-3 facility at LLNL. Further, we contend that NNSA preparation and completion of a CBNP PEIS, besides meeting legal obligations under NEPA, will serve to improve the program, specific facilities (such as the proposed LLNL BSL-3 facility), interagency cooperation and public relations. We again urge the NNSA to fulfill its NEPA obligations by preparing a programmatic EIS for its Chemical and Biological National Security Program in a timely manner.

-END OF COMMENTS-

Respectfully submitted,

Colin King
Research Director

Jay Coghlan
Director

1 Predecisional Draft Environmental Assessment for the Proposed Construction and Operation of a Biosafety Level 3 Facility at Lawrence Livermore National Laboratory, Livermore, California, DOE/EA-1442, July, 2002.

2 *Ibid.*, p. 7.

3 *Ibid.*, p. 6.

4 *Ibid.*

5 Environmental Assessment for the Proposed Construction and Operation of a Biosafety Level 3 Facility at Los Alamos National Laboratory, Los Alamos, New Mexico, DOE/EA-1364, February 26, 2002.

6 LLNL Draft EA, p. 26.

7 *Ibid.*, p. 26.

8 *Ibid.*, p. 18.

9 "Preliminary Hazards Analysis for the Biosafety Level-3 Laboratory at Los Alamos National Laboratory," Los Alamos National Laboratory, LA-UR-01-1337, February 15, 2000.

10 Environmental Assessment for the Proposed Construction and Operation of a Biosafety Level 3 Facility at Los Alamos National Laboratory, Los Alamos, New Mexico, DOE/EA-1364, February 26, 2002, p. 42.

11 LLNL Draft EA, p. 15.

12 LANL Final EA, p. vii.

13 Security Gaps at Department of Energy Nuclear Weapons Facilities, Representative Edward Markey, United States Congress.

14 "Los Alamos National Laboratory (LANL) agrees with NNSA that the best overall decision to meet the post September 11 challenges for the long-term security of nuclear activities associated with [Technical Area] –18 is to move the CAT I/II [nuclear] materials to the Nevada Test Site's Device Assembly Facility." Personal correspondence from John Browne, Director, LANL to Dr. Everet Beckner, Deputy Administrator, Defense Programs, NNSA, June 28th 2002.

15 The facility reviews in the DA's FEIS is very similar to LLNL's proposed facility. Though the DA designed the facility as a BSL-4, this was done only for added safety and security. The DA states that no BSL-4 work would ever be conducted in this facility, only BSL-3 work. Additionally, the DA facility is designed for small mammal aerosol challenges with the causative agents for anthrax, Q fever, etc, just as the LLNL proposed facility.

16 Final Environmental Impact Statement, Life Sciences Test Facility, Dugway Proving Ground, Utah, Department of the Army, March 1992, p. G-14-5.

17 *Ibid.*, p. A-20.

18 *Ibid.*, p. G-15.

19 Draft EA, p. 47.

20 DA DPG FEIS, p. G-24.

21 *Ibid.*, Appendix III, p. 3.

22 The Modified Mercalli Scale states for:

"Intensity VIII: Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Disturbed persons in motor cars.
Intensity IX: Damage considerable in specially designed structures; well designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse, Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken." *Ibid.*, p. 4.

23 "Earthquake Probabilities in the San Francisco Bay Region: 2000-2030 – A Summary of Findings," Working Group on California Earthquake Probabilities, USGS, Report 99-517, 1999.

24 *Ibid.*

25 USGS Earthquake Hazards Program, North of Livermore Valley, California 1980 01 24 19:00:09.5 UTC, 5.9M, Intensity VII, neic.usgs.gov/neis/eqlists/USA/1980_01_24.html.

26 Draft EA, p. 19.

27 LANL Final EA, BSL-3, p. A2-1.

28 Draft EA, p. 8.

29 CBNP FY00 Annual Report, NNSA Office of Nonproliferation Research and Engineering, p. 1.

30 *Ibid*, p. 45.

From: chelseavc@gmail.com [mailto:chelseavc@gmail.com] **On Behalf Of** Chelsea Collonge, NDE
Sent: Tuesday, May 08, 2007 12:41 PM
To: Brinker, Samuel
Subject: Comment on the BSL-3 lab EA

Hello,
I'm writing to express my opposition to the approval of the BSL-3 level facility at LLNL.
A BSL-3 facility would allow LLNL to experiment with some of the deadliest agents known.
This program could endanger workers and the
entire SF bay 7 million of people because Livermore Lab has a history of leaks, spills, fires, explosions and accidents. Radioactive and
toxic contaminants have found their way from DOE operations at LLNL into the air, groundwater and soil on-site and off-site, and have jeopardized the health of workers and surrounding communities with in 50 mile radius.
The EA needs more analysis of these dangers.
Sincerely,
Chelsea Collonge
Nevada Desert Experience
702-646-4814

TESTIMONY OF ROBERT CURRY, Ph.D.
REGARDING THE REVISED LLNL BSL-3 EA'S
DEFICIENT SEISMIC ANALYSIS

I, Robert R. Curry, declare as follows:

1. I am an Emeritus Professor of Geology at the University of California, Santa Cruz, and am currently Research Director of the Watershed Institute, California State University, Monterey. I am a Registered Geologist in the State of California with over forty years of experience in this field.

2. I received a Ph.D. from U.C. Berkeley in 1967 in Geology and Geophysics, and taught as a Full Professor at U.C. Santa Cruz in the field of Earth Sciences for over twenty years until my retirement in 1994. I continue to advise graduate students in the field of Earth Sciences in the U.C. system, and currently teach courses in this field at California State University, Monterey. My research specialities include Geologic Hazards such as the seismic hazards associated with active earthquake faults.

3. I have authored and edited over one hundred peer-reviewed scholarly papers, including books, monographs and articles published in professional and scientific journals.

4. I have reviewed the Revised Environmental Assessment ("Revised EA") for the proposed construction and operation of a Biosafety Level-3 facility at Lawrence Livermore National Laboratory ("LLNL"), prepared by the United States Department of Energy, National Nuclear Security Administration, dated April, 2007. I reviewed in

particular those pages of the Revised EA which discuss "Geology/Soils/Seismology." (*Id.* at 37-39 and 49-51, and Appendix H to the LLNL Sitewide EIS/2005). I have also conducted a literature search and reviewed a number of widely-available professional studies concerning the seismology of the Livermore region, including its two active fault zones in the immediate vicinity of the Lawrence Livermore National Laboratory, the Greenville Fault, and the Las Positas Fault. I have also participated in a field conference and monitoring study focused on the active faulting in the Livermore area and have revisited the monitoring network frequently over the past 27 years to assess its continuing activity.

5. The Revised EA's discussion of the seismology of the Livermore region (*id.* at 38) concludes that the potential risk posed by active earthquake faults in the vicinity of the Livermore site is as follows:

> Seismic hazard analyses have been performed for the Livermore Site to quantify the hazard. The analyses identify the probability of exceeding a given peak ground acceleration. The 2005 SWEIS describes the maximum horizontal peak ground accelerations at the Livermore Site for return periods of 500 and 1,000 years as 0.38 g, and 0.65 g, respectively. The technical basis for these peak acceleration values is provided in Appendix H of the 2005 Sitewide EIS (DOE 2005).

Revised EA at section 3.3.6, "Geology/Soils/Seismology," p. 38.

6. In my professional judgment, the foregoing description of the seismology of the Livermore Site is demonstrably mistaken. According to widely-available, published data and analysis of the active fault systems in proximity to the Livermore Site, the maximum ground surface acceleration that may reasonably be expected within the life of the proposed BSL-3 laboratory is at least 1.0 g. *See*, e.g., *Preliminary Report on September 28, 2004 Parkfield Earthquake* by Rakesh K. Goel and Charles B. Chadwell of the Department of Civil & Environmental Engineering, Cal Poly State University, San Luis Obispo (October 5, 2004) at p. 3, confirming that "1.13 g and 1.31 g accelerations were recorded" at two recording stations 9.2 and 12 kilometers, respectively, from the epicenter of this Richter magnitude 6.0 earthquake (Attachment 1 hereto).

7. The Revised EA states that "[t]he facility is capable of withstanding the g-force predicted for a return period of 1,000 years without loss of containment or structural integrity . . . . [with] damage to the structural systems . . . expected to be very slight [and with only] . . . minor cracking" to non-structural elements. Revised EA, p. 51. This statement overlooks recent published documentation that shows much greater accelerations for quakes of Richter magnitude 6.0. It also ignores the recent seismic history of this site. On January 24, 1980, a magnitude 5.9 earthquake struck the Livermore area. This earthquake injured 44 people and caused several million dollars in property damage in Livermore and at the Lawrence Livermore Laboratory. Damage

included fallen ceiling tiles, fallen bricks from chimneys, broken gas and water lines, broken windows, and displacement of mobile structures from supporting foundations. At the Ordway Ranch (on Vasco Road, north of Livermore), a brick-and-stone fireplace was displaced from the adjacent wall, as was a smaller fireplace in another room. At the intersection of Interstate 580 and Greenville Road (about 4 kilometers north of the Lawrence Livermore Laboratory), pavement on the overpass dropped about 30 centimeters (approximately 1 foot) and concrete on one abutment cracked and spalled.

8. The Greenville Fault could cause such severe damage in Livermore again. In my professional judgment, the Greenville Fault poses an extreme earthquake hazard for the Livermore Site, and is easily capable of producing severe earthquakes capable of serious structural damage to the proposed BSL-3 facility within its projected life. Further, periodic earthquake swarms have continued at Livermore since the 1980 quake (most recently in February 2004), indicating continuing deformation due to ongoing strain along this fault at depth.

9. The seismic risks posed by the Greenville Fault are not limited to severe ground shaking. They also include surface displacement. The 1980 quake caused extensive surface rupture along the Greenville Fault, located approximately 15 kilometers southeast of Livermore. The surface rupture promulgated by this quake traveled as far north as Interstate Highway 580, and was observed for a distance of about 6 kilometers along the Greenville Fault. Where the fault crosses Vasco Road, right-lateral offset was

as much as 2 centimeters; right-lateral offset of 5-10 millimeters was observed on Laughlin Road extending to the northwest for about 300 meters. I observed this offset in the field in 1980.

10. This major quake was followed by at least 59 aftershocks within the next six days, indicating a very active and unstable fault system. For example, one of these aftershocks, occurring approximately 14 kilometers south of the epicenter of the January 24 quake, occurred on January 27. Six persons were injured at Livermore by flying glass and falling ceiling tiles and supports. Even more severe property damage occurred in the Tassajaro Valley area and at Danville, respectively 17 and 28 kilometers northwest of the epicenter. In the Tassajaro Valley (northeast of Livermore), about fifty houses sustained damage, including a toppled chimney, broken windows, and walls separated from ceilings. In Danville, one brick chimney was broken off at the roofline, a stone wall was demolished, and walls, ceilings, sidewalks and patios were cracked.

11. The Revised EA's conclusion (*id.* at p. 51) that the "maximum ground surface acceleration for the LLNL Site" expected over the next one thousand years is only "0.73 g" is contrary to extensive empirical data. For example, it is contradicted by the recent history of earthquakes in Northern California. The Richter magnitude 6.0 Parkfield quake of 2004 generated ground accelerations of 1.31 g at a distance of 12 kilometers from the epicenter, as documented in the report by Goel and Chadwell that I attach to this Testimony. The Greenville, Los Positas and Mt. Diablo Faults located near

Livermore are all capable of producing a quake with a Richter magnitude roughly equivalent to the 6.0 magnitude Parkfield quake.

12. In my professional judgment, given the potentially severe consequences to public health and safety from a release of the pathogens proposed to be used in the BSL-3 facility at Livermore, it would be imprudent to employ design criteria assuming less than a 1.3 g peak horizontal ground acceleration at this location. Furthermore, because these peak accelerations within the ground may be amplified by the overlying structures, actual local acceleration of these structures may exceed 2.0 g where certain frequencies are amplified. For example, according to studies conducted by Geomatrix Consultants in 1991, spectral acceleration of up to 2.5 g is expected in structures experiencing only two percent damping over Soil Type 2 during a ground acceleration event of 0.9 g at the Livermore Site.

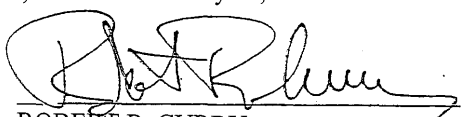
13. The Revised EA's discussion of "Abnormal Events and Accidents for Facility Operation" (*id.* at 50-51) repeats the same erroneous information, stating that "[t]he maximum horizontal peak ground accelerations at the Livermore Site for varying return periods of 500 and 1,000 [years] [are] 0.38 g and 0.65 g, respectively." As noted above, the maximum acceleration at this site for these return intervals is at least 1.31 g.

14. The revised EA's statement that seismic activity would not occasion any releases of pathogens, because "damage to the structural systems from a [maximum] horizontal peak ground acceleration of 0.73 g is expected to be very slight," is wrong for

several reasons. Revised EA at 51. This conclusion is incorrect because this site is subject to ground acceleration in excess of 1.0 g during the projected life of the facility. Additionally, this statement fails to take into account the potential for *surface rupture* as occurred extensively during the quakes on the nearby Greenville Fault in 1980 as I noted above. The Las Positas Fault located adjacent to the Livermore Site is also capable of causing surface displacement including subsidence which could crack foundations and trigger structural failure as occurred during the 1980 quake on the Greenville Fault.

15. For the above reasons, I conclude that the Revised EA fails to disclose adequately the Livermore Site's potential for significant structural damage due to foreseeable seismic events. Such damage could cause the release of pathogens proposed to be used within this BSL-3 facility. In my professional judgment, the Revised EA masks a significant risk to public health and safety posed by operation of this facility.

I declare under penalty of perjury that the foregoing facts are true of my personal knowledge based on review of relevant and reliable scientific literature, that the conclusions expressed above reflect my best professional judgment, and that this declaration was executed in Soquel, California on May 11, 2007.



ROBERT R. CURRY

PRELIMINARY REPORT ON SEPTEMBER 28, 2004 PARKFIELD EARTHQUAKE

By
Rakesh K. Goel, M.EERI and Charles B. Chadwell, M. EERI
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Email: rgoel@calpoly.edu, chadwell@calpoly.edu

A strong earthquake of magnitude 6.0 (M_w) struck the Central Coast of California at 10:15:24 AM PST (17:15:24 UTC) on Tuesday, September 28, 2004. The epicenter (Figure 1) was 11 km (7 mile) SSE of Parkfield, at a depth of approximately 8 km (5 mile). The main shock was followed by a strong aftershock of magnitude 5.0 roughly four minutes later. As expected, numerous smaller aftershocks continue to strike to epicentral region. At the time of this report, no injuries have been reported and the damage is light, mostly limited to nonstructural damage. This preliminary report presents basic information on the epicenter location, intensity of shaking, and performance of structures in the epicentral region.

Epicenter Location and Shaking Intensity

The epicenter of the earthquake was 11 km (7 mile) SSE of Parkfield. Early analysis by the USGS and UC Berkeley indicate that the event had a strike-slip mechanism and most likely occurred on the San Andreas Fault. The fault appears to have ruptured primarily in the north-west direction as evident from the pattern of aftershocks (Figure 2). Strong shaking during this event lasted for about 10 seconds in the epicentral region. This earthquake is the seventh in a series of repeating earthquakes on this stretch of the fault. The previous events were in 1857, 1881, 1901, 1922, 1934, and 1966. The previous two earthquakes ruptured the opposite direction from NW to SE along this section[1].

Figure 3 shows the instrumental shaking intensity map for the 2004 Parkfield earthquake. The instrumental intensity was about VI in the epicentral region, which corresponds to strongly-felt shaking but light damage. The instrumental intensity in the Paso Robles, Templeton, Atascadero region was about V. Note that this region experienced significant structural and nonstructural damage during the magnitude 6.5 San Simeon earthquake that struck the Central California on December 23, 2003. Figure 4 shows the contours of peak ground accelerations (PGA) made available at the CISN[2] site shortly after the earthquake. As more information on recorded motions becomes available, it is expected that the information in Figures 3 and 4 will be updated.

[1] Source: http://www.cisn.org/special/evt.04.09.28/
[2] http://www.cisn.org/shakemap/nc/shake/51147892/pga.html

ATTACHMENT 1

September 28, 2004 Parkfield Earthquake

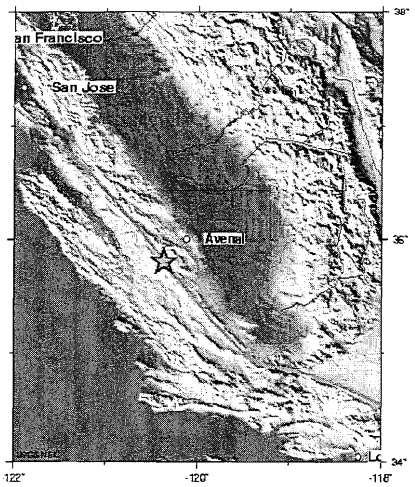

Figure 1. Epicentral location of the September 28, 2004 Parkfield earthquake[3].

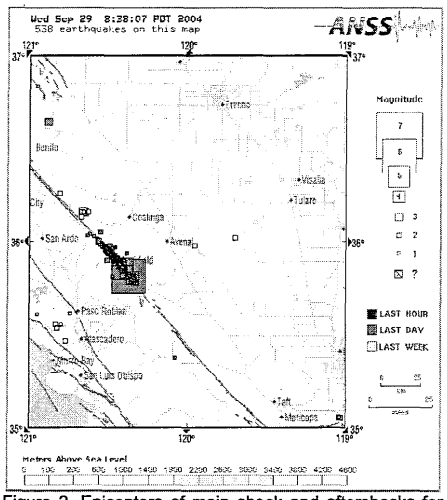

Figure 2. Epicenters of main shock and aftershocks for the September 28, 2004 Parkfield earthquake[4].

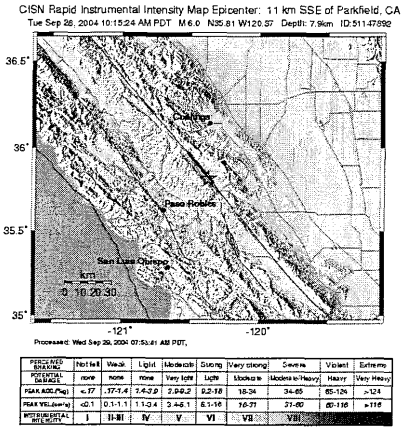

Figure 3. Intensity map (CISN).

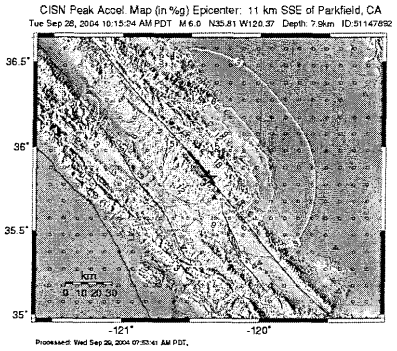

Figure 4. Peak ground acceleration map (CISN).

[3] Adapted from USGS NEIC website: http://neic.usgs.gov/neis/bulletin/neic_nybg.html
[4] Adapted from ANSS website: http://quake.wr.usgs.gov/recenteqs/FaultMaps/120-36.htm

Recorded Motions

Due to active seismic history of the epicentral region, the Parkfield area is heavily instrumented by both the California Strong Motion Program (CSMIP) and the United States Geological Survey (USGS). However, very few recording stations in this area possess modern digital technology with automated communication capability. The CSMIP is trying to recover data from analogue recording instruments and has made the recorded ground acceleration traces available online[5]. A list of the recording stations close to the epicenter available at the time of this report is shown in Table 1. Note that the data from these stations, with the exception of Parkfield – Cholame 5W, was available in analogue form – traces of the accelerations histories in the east-west, vertical, and north-south directions – at the time of this report.

The early reports indicate that the fault rupture propagated north-east of the epicenter. The conventional wisdom would, therefore, suggest that the ground motions should be stronger north of the epicenter compared to south of the epicenter. However, recorded motions indicate an strong shaking both south and north of the epicenter: 0.84g, 0.82g, 0.61g, and 0.82g acceleration was recorded at Parkfield–Stone Corral 1E (7.8 km south-east), Parkfield-Fault Zone 1 (8.8 km south), Parkfield-Cholame 2W (Sta 2) (12 km south-west), and Parkfield Cholame 3E (12 km south-east), respectively; 1.13g and 1.31g accelerations were recorded at Parkfield-Fault Zone 11 (9.2 km north-east) and Parkfield-Fault Zone 14 (12 km north), respectively. At the time of this report, reasons for this pattern of PGA distribution are being investigated.

At the time of preparing this preliminary report, digital information on the recorded ground motions was available from one ground site: Cholame Station 5W, which is about 13 km from the epicenter. At this station, the recorded PGA value in the east-west, north-south, and vertical direction are 0.25g, 0.23g, and 0.17g, respectively (Figure 5). The horizontal acceleration records contain noticeable pulses that appear to be consistent with past observations on near-fault acceleration recordings. Similar pulses are visible in traces of accelerations at several other recording stations listed in Table 1.

Linear elastic response spectra (5% damping) for the three components of the acceleration at the Cholame 5W station are shown in Figure 6. Also included for comparison is the elastic design spectrum (R = 1) for UBC-97 without near-source factors and for a stiff-soil site condition. This figure clearly shows that the response spectrum in the east-west direction, the predominant fault-normal direction, is higher than the response spectrum in the north-south direction, the fault-parallel direction, for periods up to about 0.75 sec. This observation is consistent with the expectation in near-fault zones that fault-normal ground motion is stronger than fault-parallel motion. For this station, the linear elastic response spectra in both horizontal directions are lower than the UBC-97 elastic design spectrum. For other recording stations with more intense ground shaking, however, such a conclusion may not be valid.

In addition to free-field recordings, motions were recorded on a Caltrans bridge. This bridge is located on Highway 46, roughly 11 km south of the epicenter and 150 m west of the San Andreas Fault. The recorded shaking at the abutment was 0.67g, with shaking recorded on the deck near the east abutment of 1.05g. This bridge was immediately operational after the earthquake. The high accelerations at the east abutment appear to be due to pounding between the deck and the abutment.

[5] http://www.quake.ca.gov/cisn-edc/IQR/Parkfield_28Sep2004/iqr_dist.htm

Table 1. Recording stations and peak ground accelerations within 15 km of the epicenter[6].

Station Name	Station No./ID	Network	Dist. (km)	PGA (g)	
				NS	EW
Parkfield - Gold Hill 1W	36415	CGS	0.5	0.15	0.16
Parkfield - Gold Hill 2W	36416	CGS	1.6	0.28	0.17
Parkfield - Fault Zone 4	36414	CGS	3.0	0.12	0.13
Parkfield - Fault Zone 3	36408	CGS	3.9	0.41	0.38
Parkfield - Gold Hill 2E	36421	CGS	3.9	0.23	0.17
Parkfield - Gold Hill 3W	36420	CGS	4.0	0.45	0.85
Parkfield - Fault Zone 6	36454	CGS	6.4	0.22	0.18
Parkfield - Fault Zone 7	36431	CGS	6.8	0.25	0.24
Parkfield - Fault Zone 8	36449	CGS	7.0	0.51	0.63
Parkfield - Gold Hill 3E	36439	CGS	7.1	0.11	0.21
Parkfield - Gold Hill 4W	36433	CGS	7.1	0.40	0.43
Parkfield - Stone Corral 1E	36419	CGS	7.8	0.84	0.73
Parkfield - Stone Corral 2E	36422	CGS	8.3	0.20	0.19
Parkfield - Fault Zone 1	36407	CGS	8.8	0.82	0.59
Parkfield - Fault Zone 11	36453	CGS	9.2	1.13	0.57
Parkfield - Fault Zone 9	36443	CGS	9.6	0.10	0.16
Parkfield - Stone Corral 3E	36437	CGS	9.6	0.23	0.20
Parkfield - Elementary School	36531	CGS	10	0.29	0.23
Parkfield - Gold Hill 5W	36434	CGS	10	0.19	0.25
Parkfield - Fault Zone 12	36138	CGS	10	0.31	0.27
Parkfield - Cholame 1E	36452	CGS	11	0.37	0.45
Parkfield - Cholame 2W (Sta 2)	36228	CGS	12	0.37	0.61
Parkfield - Cholame 3W	36410	CGS	12	0.58	0.34
Parkfield - Cholame 3E	36450	CGS	12	0.82	0.53
Parkfield - Cholame 4W	36411	CGS	12	0.52	0.58
Parkfield - Cholame 2E	36230	CGS	12	0.51	0.48
Parkfield - Fault Zone 14	36456	CGS	12	0.59	1.31
Parkfield - Cholame 4AW	36412	CGS	13	0.29	0.30
Parkfield - Cholame 5W (Sta 5)	36227	CGS	13	0.23	0.25
Parkfield - Gold Hill 6W	36432	CGS	14	0.10	0.11
Parkfield - Cholame 6W	36451	CGS	14	0.39	0.24
Parkfield - Fault Zone 15	36445	CGS	15	0.23	0.15

[6] Information for CISN (10/5/04)

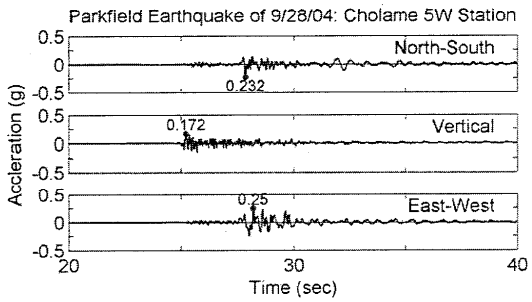

Figure 5. Ground accelerations recorded at the Cholame 5W Station during the Parkfield earthquake of September 28, 2004 (Data from CISN).

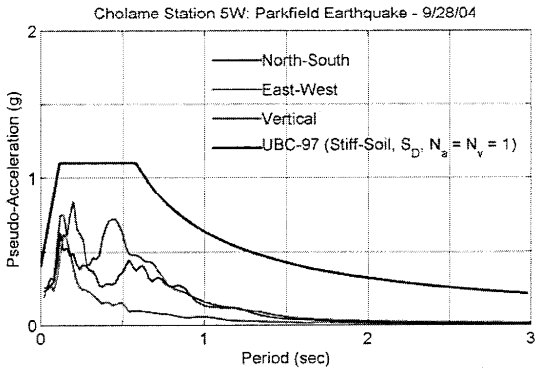

Figure 6. 5%-damped elastic response spectrum for three components of ground accelerations recorded at the Cholame 5W Station during the Parkfield earthquake of September 28, 2004, and the UBC-97 design spectrum for stiff-soil with near-source factors equal to 1 (Data from CISN).

Structural Performance

Consistent with a moderate-size earthquake in California, the damage, overall, was mostly nonstructural. The area of Parkfield is rural and sparsely populated with approximately 37 local inhabitants (Figure 7). The building stock of Parkfield consists primarily of low rise, single family, timber construction with wood and stucco facades.

Overall, minor nonstructural damage was observed to local residences through drywall cracking, stucco cracking, a collapsed un-reinforced masonry parapet wall, broken windows, and fallen bookcases. There were reports from local residents of two chimneys that suffered moderate damage but these were not confirmed by the investigators at the time of this report.

Local bridges showed minor to no damage and were open with immediate occupancy post event. The bridge located at the intersection of Cholame Road and Parkfield-Coalinga Road (Figure 8) in Parkfield, which crosses the San Andreas Fault, did show approximately 4 cm of separation between the approach slab and abutments that was quickly filled with asphalt by the bridge maintenance crew.

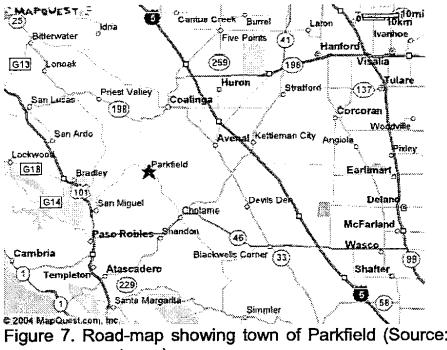

Figure 7. Road-map showing town of Parkfield (Source: www.mapquest.com).

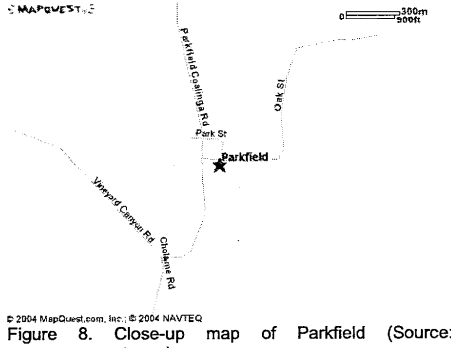

Figure 8. Close-up map of Parkfield (Source: www.mapquest.com).

Typical Building Performance

There was no noted damage to the Parkfield Café and the Parkfield Inn, two major structures in central area of the town. However, there were reports of minor structural and significant nonstructural damage to residential buildings in the area. The damage pattern described next for two residences located on Parkfield Coalinga Road (Figure 8) roughly 7 and 5 km north of Parkfield is typical of what has been reported in the epicentral region.

The first residence is a two-story timber building constructed originally in the late 1800's with a substantial addition constructed in the 1930's. The house is located less than 0.5 km from the San Andreas Fault. The strongest shaking at this location occurred in the fault-normal, east-west direction, as evident by fallen stacks of firewood in the east-west direction (Figure 9). Significant cracking was observed in the plaster (stucco finish) throughout the house but primarily in the east-west direction (Figure 10). As expected, separation also occurred between the older and newer portions of the residence (Figure 11). Although shaking at the site caused significant cracking in the stucco, the masonry chimney of the house did not show any signs of distress (Figure 12). This is due to retrofit of the chimney by strapping it at several levels to the house (Figure 13).

The second home was constructed in the 1950's but had undergone several renovations and upgrades in recent times. This house is located immediately adjacent to the San Andreas Fault that runs through the backyard. The damage in the residence predominately was nonstructural but substantial. The home suffered extensive drywall cracking (Figure 14) and other content damage (Figures 15 and 16). Outside, a timber canopy separated from the house and was dangerously leaning (Figure 17) and a portion of the unreinforced masonry parapet wall collapsed (Figure 18).

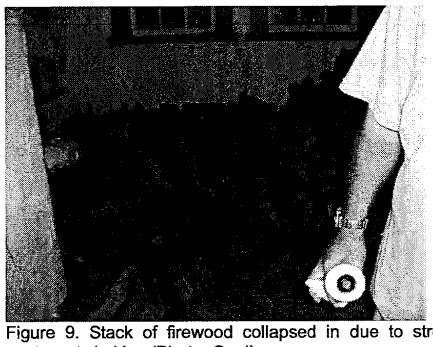

Figure 9. Stack of firewood collapsed in due to strong east-west shaking (Photo: Goel).

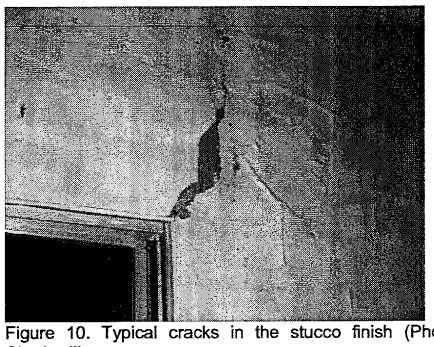

Figure 10. Typical cracks in the stucco finish (Photo: Chadwell).

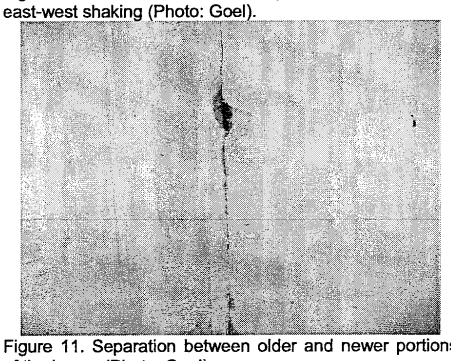

Figure 11. Separation between older and newer portions of the house (Photo: Goel).

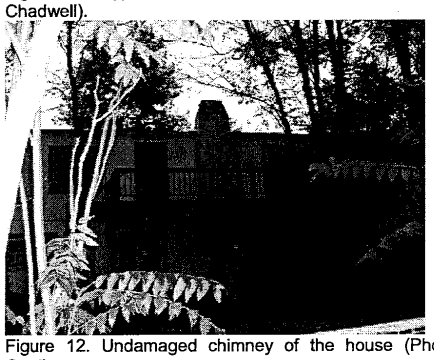

Figure 12. Undamaged chimney of the house (Photo: Goel).

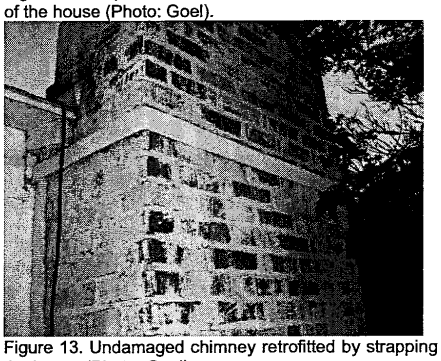

Figure 13. Undamaged chimney retrofitted by strapping to the house (Photo: Goel).

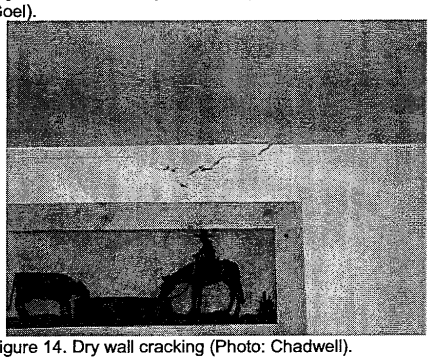

Figure 14. Dry wall cracking (Photo: Chadwell).

Figure 15. Damage to contents of the entertainment center (Photo: Chadwell).

Figure 16. Damage to office area of the house (Photo: Goel).

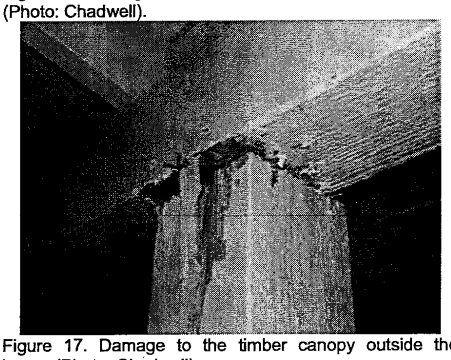

Figure 17. Damage to the timber canopy outside the house (Photo: Chadwell).

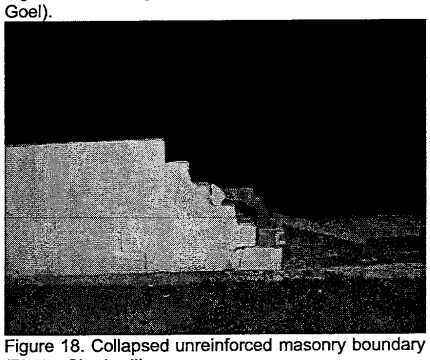

Figure 18. Collapsed unreinforced masonry boundary wall (Photo: Chadwell).

Bridge Performance

Two bridges were investigated in the reconnaissance. The first bridge, located approximately 8 km south of Parkfield, is typical of many bridges in the area: multi-span, steel riveted viaduct bridge with a concrete steel composite roadway. This bridge showed no signs of distress. There was evidence of ground shaking from surface cracking found surrounding the pile extensions (Figure 19) and some signs of minor distress apparent from fresh peeling of paint at the girder-column joint (Figure 20).

The second bridge investigated is located at the intersection of Cholame Road and Parkfield-Coalinga Road (Figure 8) in Parkfield and crosses the San Andreas Fault (Figure 21). This bridge had apparently undergone a recent retrofit and performed adequately. The minor distress to the bridge included roughly 4 cm separation between the approach slab and the bridge deck, which was filled up quickly by the bridge maintenance crew (Figure 22). Below the deck level, the concrete bent caps had minor shear cracking through the knee joints (Figure 23 and 24) as well as evidence of the flexural cracking at the top of the pile extension (Figure 25). The pile extensions at the ground level also exhibited noticeable movement (Figure 26). In addition, there was evidence of recent motion (approximately 4 cm) in the bridge bearings supporting the superstructure. Angle iron apparently installed in an effort to restrain transverse motion of the superstructure at the bearings was knocked free (Figures 27 and 28).

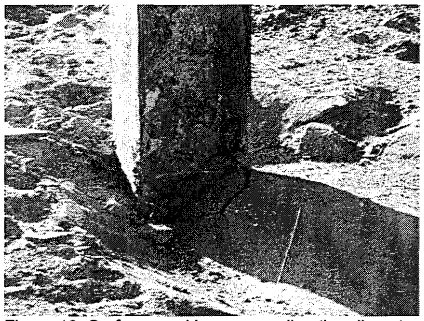

Figure 19. Surface cracking surrounding the pile extension (Photo: Chadwell).

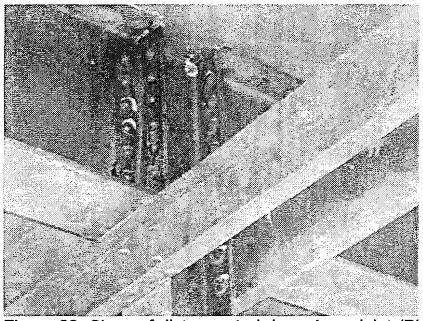

Figure 20. Signs of distress at girder-column joint (Photo: Goel).

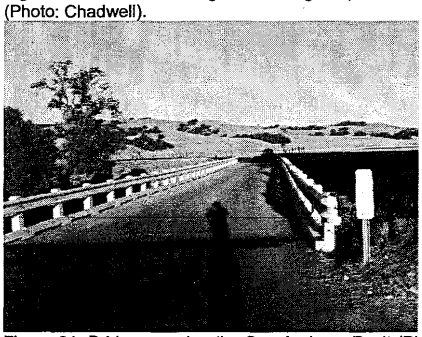

Figure 21. Bridge crossing the San Andreas Fault (Photo: Goel).

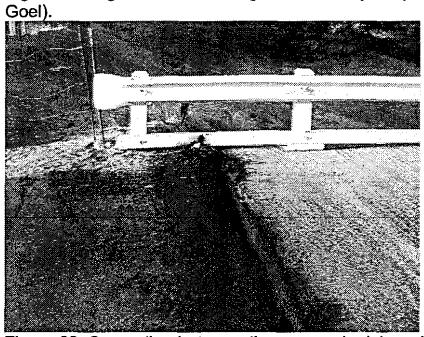

Figure 22. Separation between the approach slab and the bridge deck (Photo: Chadwell).

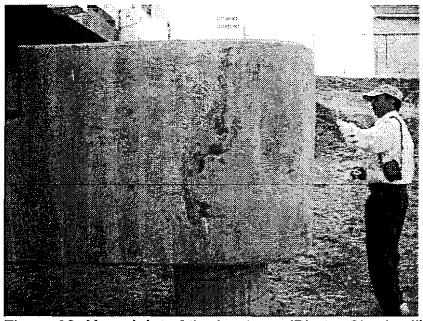

Figure 23. Knee-joint of the bent cap (Photo: Chadwell).

Figure 24. Fresh shear cracks in the knee joint of the bent cap (Photo: Goel).

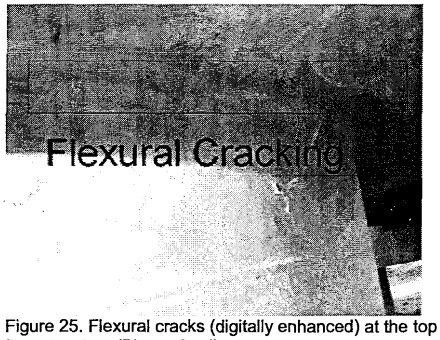

Figure 25. Flexural cracks (digitally enhanced) at the top of file extension (Photo: Goel).

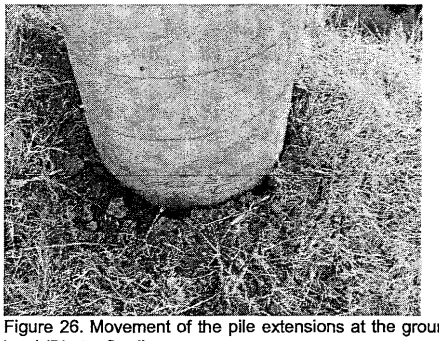

Figure 26. Movement of the pile extensions at the ground level (Photo: Goel).

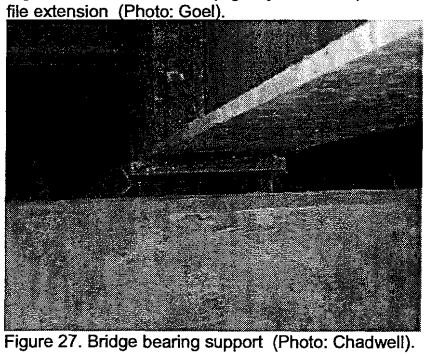

Figure 27. Bridge bearing support (Photo: Chadwell).

Figure 28. Movement at the bridge bearing (Photo: Chadwell).

From: Mary Davis [mailto:yggdrasili@yahoo.com]
Sent: Thursday, May 10, 2007 5:53 AM
To: Brinker, Samuel
Subject: Comments BSL-3 at Livermore

To:
Samuel Brinker,
National Environmental Policy Act Document Manager
U.S. Department of Energy,
National Nuclear Security Administration,
Livermore Site Office, M/S L-293,
P.O. Box 808, Livermore, CA 94551-0808

I am writing to oppose operation of a bio-warfare research facility, level 3, at the Livermore site.

The Livermore Laboratory should not be used for bio-warfare research. It is unconsciounable to manipulate deadly biological agents in such a heavily populated area as Livermore. The site is near a seismic fault line. Furthermore, it is wrong to carry out work on nuclear weapons and biological weapons at the same site, in part because the combination will complicate monitoring of the facility.

The revised Environmental Assessment does not adequately evaluate the danger posed vy the pathogens themselves or by a possible terrorist attack on the laboratory.

Apart from problems with the site itself, experimentation on biological agents by the United States, even if only for defensive purposes, is likely to lead to a biological-weapons arms race, because other countries cannot be certain that our intentions are defensive only. It is well known that research in defensive use of agents can be applied to offensive use of these agents. An arms race in biological weapons would potentially harm rather than help the United States. Therefore, operation of the Livermore facility would put a huge population at risk for no demonstrably useful purpose.

The Department of Energy should hold a public hearing to allow oral comments on its proposal and also should extend the deadline for written comments.

Please reply to this e-mail to let me know that my comments have been received and will be recorded.

Sincerely,
Mary Davis PhD
Yggdasil, a project of Earth Island Institute
POB 910476, Lexington, KY 40591-0476

Please send me an electronic copy of the revised final Environmental Assessment at this address yggdrasili@yahoo.com

-----Original Message-----
From: Peter Dragovich [mailto:mp4ever@mac.com]
Sent: Wednesday, May 16, 2007 11:40 AM
To: Brinker, Samuel
Subject: BSL 3

Dear Mr. Brinker,

I, and many concerned citizens, are appalled that there have no public hearings regarding the proposed biowarfare agent research facility (BSL-3) intended to be placed in Livermore, California. It is imperative that the Department of Energy (DOE) hold a public hearing so that the public can learn more about this plan and provide oral comments. So far, the number of public hearings that DOE has held on this important issue is ZERO.

Unfortunately the 30-day written comment period (which ended May 11, 2007) was too short. Most area residents and other interested members of the public didn't know about the comment period. It was not been widely publicized by the Department of Energy or Livermore Lab. Therefore, people are being deprived of their right to comment.

Therefore I am requesting the written comment deadline should be extended for a minimum of one additional month (to June 11). And, a public hearing should occur within the extended public comment deadline.

Sincerely,

Martha Dragovich

From: arpad fekete [mailto:arpadfekete@hotmail.com]
Sent: Friday, May 04, 2007 7:31 PM
To: Brinker, Samuel
Subject: Livermore Lab

To whom it may concern,

Dear Madam or Sir,

My name is Arpad Fekete ,I'm a resident of Livermore.
I would like to react to the news that the US Goverment
wants to locate dangerous bio agents to the Livermore
Lab. Since the Lab is in the middle of a very populated area,
any kind of accident, disaster or terrorist act could jeopardize
the people's life who live in this enviroment. We have kids I
have two and about twenty thousand children live within
a few miles.If anything bad happened the value of the pro-
perties would become practically zero.
Please, take my argument into consideration and rethink
everything before you decide.

sincerely Arpad Fekete
777 Polaris Way
Livermore,CA 94550

311 Douglass Street
San Francisco, CA 94114
May 11, 2007

Samuel Brinker
National Environmental Policy Act Document Manager
U.S. Department of Energy
National Nuclear Security Administration
Livermore Site Office, M/S L-293
P.O. Box 808
Livermore, CA 94551-0808

email: samuel.brinker@oak.doe.gov

Dear Mr. Brinker,

I am writing on behalf of the SF-Bay Area Chapter of Physicians for Social Responsibility (SFPSR), representing approximately 3,000 physicians and health professionals throughout the SF-Bay Area, to comment on the Revised Environmental Assessment regarding the proposed construction and operation of a Biosafety Level 3 (BSL-3) facility at the Department of Energy(DOE)'s Lawrence Livermore National Laboratory(LLNL). As an organization dedicated to ending the dangers posed by the proliferation of all weapons of mass destruction, including biological weapons, and to the protection of public health, we continue to have a number of major concerns about the plans for establishing a BSL-3 facility at LLNL, and about the planned proliferation of similar operations throughout the DOE complex. As we believe that many of the comments made at the time of our previous submission in September 2002 were inadequately addressed in Appendix C of the recently released draft EA, some of the points that follow will raise similar concerns, updated as necessary.

Need for Programmatic and Project-Specific EIS

The plans for building and operating a BSL-3 facility at LLNL need to be examined in the context of DOE's overall plans to develop a new integrated program through multiple facilities on researching bio-warfare agents, putatively for defensive purposes. We believe that NNSA's contention that "planned research efforts consist of projects too diverse and discrete to require either a `major Federal action' or activities sufficiently 'systematic and connected' so as to require a programmatic NEPA , especially an EIS" amounts to no more than bureaucratic dissembling. SFPSR continues to believe that it is imperative that a Programmatic and Project-Specific EIS be prepared to adequately review the integrated and cumulative effects of undertaking this mission area, particularly as regards potential weapons proliferation and health risks. As such, we believe that the plans for a BSL-3 facility at LLNL need to address the public and environment health impacts of the potential siting of a BSL-3/BSL-4 bio-warfare agent animal research lab proposed for Site 300 in Tracy. In addition, a full analysis of alternatives, which is absent from the draft EA, but central to a PEIS, continues to be warranted.

Proliferation Issues

SFPSR continues to have major concerns about proposed work involving numerous pathogenic organisms, including genetically-modified varieties, that would tend to severely undermine the internationally sanctioned, primary-prevention-based *alternative* to the proliferation of, and dangers posed by biological weapons-—the Biological Weapons Convention (BWC). This is especially disturbing given the continued rejection by the U.S. government of global efforts to develop strong inspection and verification protocols for the BWC that persist through 2007. We continue to believe strongly that since DOE encouraged U.S. government leaders to scuttle the draft international agreement of 2001, the fact that high-level research on biological agents will be performed secretly in weapons facilities such as LLNL will likely be viewed with suspicion by the world community, encouraging a global biological weapons race. In this regard, it remains instructive to recall the September 2001 *New York Times* reports of U.S. plans to work with genetically-modified anthrax, and of the prototype germ warfare facility developed at the Nevada Test Site, that raised widespread concerns about possible U.S. violations of the BWC.

As we noted in our previous comments, the EA states that viable organisms expected to be used "would be, but not limited to the select agents Bacillus anthracis, Yersinia pestis, Clostridium botulinum, Coccidiodes immitis, Brucella spp., Franciscella tularensis, and Rickettsia spp," and that it "is possible that the facility would receive genetically altered microorganisms." Although the EA and subsequent response to comments states that all work with infectious microorganisms must be in strict accordance with the BWC, there is no detailed indication of how such compliance would be instituted, either at LLNL or DOE-wide. Given the universally appreciated ambiguity of much "biodefense" work, as regards offensive potential, it is important that the specific nature of any review process regarding these issues be spelled-out, and made *completely* transparent. Although the draft EA says that a LLNL biosafety committee will review experiments, there is no indication whether there will be a process to guarantee *full* public scrutiny of committee deliberations. In fact, the recent response indicates a major loophole (page C-8) regarding guaranteeing compliance with the BWC when it states: "*It is possible that some specific project information will be subject to DOE security and classification restrictions, and will consequently not be available to the public*."

Thus, in the absence of full transparency, it is difficult to imagine how experiments with the aforementioned organisms, particularly the potentially genetically-altered variety, would not provoke global concerns about offensive capabilities masked as biodefense. Even if the proposed BSL-3 is not being overtly designed as a "production facility for offensive research or weapons production," the very nature of the potential organisms that are being considered for study should indeed require a "Non Proliferation Impact Review" of the sort rejected by the NNSA through the usual circular reasoning endemic in the DOE complex for avoiding responsibility for activities highly threatening to human survival. The typical rationalization (page C-6) offered for justifying ongoing nuclear weapons work, and, in this case, provocative biological experiments as being Congressionally assigned DOE and NNSA missions, period, without regard or accountability for the obvious consequences, remains evocative of what German train conductors could have argued in defense of getting railcars packed with human beings to Auschwitz on time.

Public Health Issues

SFPSR continues to have concerns about the potential for spread of pathogenic organisms to the surrounding community. As noted in previous comments, and not addressed specifically in the recent DOE response, inadvertent exposure to pathogens has been documented, as indicated by the case of the researcher at Fort Detrick who a few years ago came down with a case of glanders, a disease that is considered a potential biowarfare agent. The researcher had spent considerable time in his community before the diagnosis was made, a fact missing in the EA reference. As such, the contention that the "likelihood of a wide area, city or population effect should be considered improbable" is unconvincing, given the multitude of dangerous organisms being considered. There remains considerable potential danger posed by the anticipated work with organisms genetically-modified to increase lethality or confer resistance to countermeasures. This point is underscored by the revelation that in 2003 UC Berkeley researchers accidentally created a "super-strain" of tuberculosis through genetic modification, and the well-publicized creation of a lethal mousepox by other researchers. Only one release in the wake of similar experiments could be disastrous for the millions of people in the SF-Bay Area.

As noted in our comments from 2002, such potential dangers need to be considered in the context of LLNL's well-documented history of leaks, spills, fires, explosions and accidents. In past years, these have included a filter shredding accident that contaminated workers with curium, a chlorine gas leak that forced an evacuation, many inadvertent releases to the sanitary sewer, as well as an explosion that sent one employee to the hospital. Radioactive and toxic contaminants have migrated from DOE
Operations at LLNL into the air, groundwater and soil both on-site and off-site, jeopardized the health of workers and surrounding communities. As we previously argued, this history should be incorporated into the EA; there is no acknowledgement of this legacy in the most recent response from DOE.

The draft EA continues to be complacent regarding the potential impact of earthquakes and other natural disasters. The proposed design wind load of a peak wind gust of 91 mph, regarded as an "extremely unlikely event" seems low given the recent profound hurricane-force winds experienced in Seattle and Vancouver. And the rather blasé explanation that "Flooding is not a design consideration at the LLNL site," per a 1992 DOE EIS for LLNL and Sandia that predates by 15 years the accumulated knowledge of extreme weather events associated with global climate change underscores an institutional resistance to providing maximum protection to a large urban population. As we stated previously, although it is asserted that quakes, fires and other natural disasters may effectively kill airborne agents, this assessment may underestimate the potential survival and distribution of hardy organisms, such as anthrax or fungal spores, not to mention whatever might be bioengineered for such capability, a possibility ignored in the DOE response

SFPSR once again concludes that there are far better, and safer ways to protect our nation, and the world from biological weapons, and all infectious disease, than the development of a national network of facilities conducting ambiguous research with extremely lethal agents. Such facilities, including the proposed one at LLNL will likely encourage increased proliferation of deadly technologies that instead require effective primary prevention. Central to such preventive efforts

should be a national commitment to a significantly strengthened Biological Weapons Convention, that with greatly improved inspection and verification protocols, could serve to protect the global population from all of the dangers associated with rapidly emerging biotechnologies, including the potential development of novel, and increasingly lethal biological weapons.

Respectfully submitted,

Robert M. Gould, MD
President
SF-Bay Area Chapter
Physicians for Social Reponsibility

Phone (W) 408-972-7299
Fax (W) 408-972-6429
rmgould1@yahoo.com

-----Original Message-----
From: contactus@cardnm.org [mailto:contactus@cardnm.org]
Sent: Thursday, May 10, 2007 1:09 PM
To: Brinker, Samuel
Subject:

Dear Mr. Brinker,

My family owns a farm downwind from Los Alamos where my son and daughter-in-law and their young daughter live.

We do not believe that Los Alamos is capable of successfully handling pathogenetic bio sustances. Please look carefully at Los Alamos' safety record before authorizing this project.

We believe that a disparate impact study should be conducted before this project is instituted. There are no health studies of the communities surrounding LANL even though we know that worker health at LANL has not been good and that most of the communities surrounding the Lab are subject to State and Federal Environmental Justice mandates.

All DOE projects should have, as part of their impact statements, an analysis of how the project will be protected from terorists. Perhaps, we could be justified in thinking that terrorism would not take place at a particular time and place before 9/11, but that time has passed. Please supplement your impact statement to include such an analysis.

Sincerely,

Janet Greenwald
Co-coordinator
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to Radioactive Dumping
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